





ILLUSTRATIONS
OF
BRITISH MYCOLOGY,
CONTAINING
FIGURES AND DESCRIPTIONS
OF
THE FUNGUSES OF INTEREST AND NOVELTY INDIGENOUS
TO BRITAIN,
BY
MRS. T. J. HUSSEY.

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“Though all that feeds on nether air  
Howe’er magnificent or fair,  
Grows but to perish, and intrust  
Its ruins to their kindred dust ;  
Yet by the Almighty’s ever during care  
Her procreant vigils Nature keeps  
Amid the unfathomable deeps ;  
And saves the peopled fields of earth  
From dread of emptiness or dearth.”—WORDSWORTH : ‘ *Vernal Ode* .’  
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INTRODUCTION.

ἐξερυσάμην βροτοὺς
τοῦ μὴ διαρραίσθέντας εἰς αἶδον μολεῖν.
Æsch. Pron. Vinc. 248.

IN teaching any science, a clear exposition of principal facts is a necessary preliminary. Some observations upon the arrangement of genera and species are required, as well as a statement of the characteristic parts of Funguses, to enable the reader to follow the descriptions of individual specimens with satisfaction. However clear and significant the terse classical expressions of botanical science may be to the adept, they are cryptical to the uninitiated; to assign, however, precise equivalents for them in common language is so difficult, that the indulgence of the masters in cryptogamic lore is entreated for the attempt; it would be a much lighter task to adhere to accepted terms, than to render them intelligible to the student by translation.

CRYPTOGAMIA.¹

FUNGI.

Plants in which the fructifying organs are so minute, that without the aid of a powerful microscope, they cannot be detected. To the naked eye, the fine dust ejected from the plant, is the only token of reproduction; this dust however is not truly seed, in the same manner that the term is used for Phenogamous² plants, “the word seed supposes the existence of an embryo, and there is no such thing in the reproductive bodies of Fungi”³. The correct terms are spores, when the seeds are not in a case (naked); sporidia when enclosed in cases (thecæ or asci). The spores or sporidia are placed in or upon the receptacle, which is of very various forms and kinds, but how different soever these may be, it is the essential part of the Fungus,

¹ From κρυπτός, *concealed*, and γάμος, *marriage*.

² From φαίνειν, *to appear*, and γάμος, *marriage*; plants which display their flowers (in opposition to the Cryptogamous).

³ Rev. M. J. Berkeley, who has recently made some most interesting observations on this subject. *Vide* also the Rev. Dr. Badham's work on the ‘Esculent Funguses of England’, in which are some very ingenious speculations on the development of the tribe from the spores.

and in many cases constitutes the entire plant. That portion of the receptacle in which the reproductive bodies are imbedded is called the hymenium; it is either external (*Hymenomyces*), as in the Agaric, where it forms gills; or included (*Gasteromycetes*), as in the Puff-balls.

The receptacle is either placed upon a stem (stipitate) or stemless (sessile); and sometimes spread in thin membranous patches (effused).

Having made these preliminary general observations, which apply to the whole Fungus family, we proceed to the first great division.

ORDER I. HYMENOMYCETES.¹

TRIBE I. PILEATI.

Receptacle dilated more or less in a horizontal direction, sometimes branched, tending to an orbicular form. Hymenium inferior.

Named from *pileus* a cap “the common head-covering of freedmen among the Romans, and therefore given as a reward to such gladiators as were slaves, in token of their being made free”. The pileus of Funguses is however the entire head of the plant, not a mere head-covering. It is generally placed upon a stem, and indeed is a prolongation of it; “on dividing an Agaric or Boletus perpendicularly, it will be perceived that the stem extends itself into a body in the form of a parasol²”. Beneath its shelter lies the fructifying membrane, scientifically defined *Hymenium inferior*. “In the hymenomycetous tribes, the essential character appears to consist in a hymenium composed of closely packed sporophores, which support on spicules a generally determinate number of spores³”. In the Cupulate and Elvel-laceous kinds the reproductive bodies are placed in cases, occasionally septate, which cases are called asci or thecæ. In stemless plants, the pileus is frequently, not merely *sessile*, but also *re-supinate*, that is, lying on its back, with the hymenium upwards; but this position there is an evident tendency to correct, one edge of the pileus often rising, turning over, and becoming what is called in that case *reflexed*.

To this tribe, *Pileati*, belong the Genera:—

1. AGARICUS.—Hymenium consisting of plates (*lamellæ*) radiating from a common centre, with shorter ones in the interstices; composed of a double closely-connected membrane, more or less distinct from the pileus.
2. CANTHARELLUS.—Hymenium dichotomous, radiating, branched folds, not distinct from the pileus.
3. MERULIUS.—Hymenium veiny, or forming unequal angular or flexuous pores, not distinct from the pileus.

¹ From *ύμην*, a membrane, and *μύκης*, a fungus.

² Persoon.

³ Berkeley.

4. SCHYZOPHYLLUM.—Gills radiating from the base, composed of a folded membrane ruptured at the edges which are revolute, bearing spores only on their outer surface.
5. DÆDALIA.—Hymenium, anastomosing gills, or flexuous elongated pores formed out of the corky substance of the pileus.
6. POLYPORUS.—Hymenium subrotund pores, with thin simple dissepiments concrete with the substance of the pileus.
7. BOLETUS.—Hymenium cylindrical separable tubes, distinct from the substance of the pileus.
8. FISTULINA.—Hymenium, tubes at first closed, wart-like, then open, of a distinct substance from the pileus, but concrete with its fibres.
9. HYDNUM.—Hymenium, free spine-like processes of the same substance as the pileus.
10. SISTOTREMA.—Hymenium, irregularly disposed curved lamellate teeth, distinct from the pileus.
11. IRPEX.—Hymenium torn into distinct spines, disposed in rows, or in a reticulate manner, their bases connected by lamellate or porous folds, concrete with the pileus.
12. RADULUM.—Hymenium tuberculated, tubercles shapeless, resembling papillæ or rude spines, distinct or irregularly fasciculate, inner substance homogeneous with the receptacle.
13. PHLEBIA.—Hymenium smooth, venoso-rugose, wrinkles interrupted, disposed irregularly, straight or flexuous, homogeneous and concrete with the pileus.
14. THELEPHORA.—Hymenium even or papillate, homogeneous and concrete with the pileus.

TRIBE II. CLAVATI.

Receptacle vertical, simple or branched, tending to a cylindrical form. Hymenium superior.

This second tribe is so named from *clavus*, a club, the form of some of the species resembling that weapon. The spores or sporidia¹, are placed all over the upper external surface, on which in a fully mature state, they are visible in the form of dust, or like the bloom of fruit in appearance.

1. CLAVARIA.—Receptacle erect, more or less cylindrical, homogeneous and confluent with the stem. Hymenium occupying the whole surface.
2. CALOCERA.—Between horny and gelatinous, tough, slimy, rooting without any distinct stem. Asci slender.
3. GEOGLOSSUM.—Receptacle erect, club-shaped, sub-compressed, produced downwards into a distinct mass. Hymenium concrete, covering the incrassated receptacle. Asci elongated.
4. SPATHULARIA.—Receptacle vertical, compressed, running down on either side into the distinct stem.
5. MITRULA.—Receptacle ovate, inflated, closely surrounding with its base the distinct stem.
6. TYPHULA.—Receptacle somewhat cylindrical, distinct from the capillary stem, bearing sporules on every side. Asci obsolete.
7. PISTILLARIA.—Receptacle slender, cylindrical, without any distinct stem. Hymenium even, occupying the whole surface, but producing sporidia only in the upper part. Asci obsolete.

¹ In the *Clavarias* they are *spores*, that is, *naked*, not in cases. In others of the tribe, *Geoglossum*, *Spathularia*, *Mitrula*, &c., they are *sporidia*; that is, enclosed in asci or thecæ. A new arrangement is perhaps desirable, but as it has not yet been completed, it is necessary to conform to the present authority, that of the 'English Flora'.

TRIBE III. MITRATI.

Receptacle bullate, pileiform, margined. Hymenium superior, never closed; reproductive bodies, sporidia packed in asci or thecæ.

These are what are called the Elvellaceous family, among them the esculent *Morel* and *Helvella crispa* are excellent articles of food, the *Morel* being of importance even in a commercial point of view.

1. MORCHELLA.—Receptacle pileate. Hymenium costate, lacunose.
2. HELVELLA.—Receptacle pileate, deflexed, lobed. Hymenium even.
3. VERPA.—Receptacle conico-deflexed, equal. Hymenium even or wrinkled.
4. LEOTIA.—Receptacle capitato-pileate, the margin revolute, bearing asci beneath as well as above.
5. VIBRISSEA.—Receptacle capitato-pileate, margin at first adnate, soon free.

TRIBE IV. CUPULATI.

Receptacle patellæform, margined. Hymenium superior, more or less closed when young, and concave.

In *Peziza*, the reproductive bodies which fly off in clouds of dust on the plant being touched, are sporidia which were regularly packed in each case. It is unnecessary to encumber the present sketch, with the sub-series and species of the *Cupulati*, many of which are minute, we refer the student to the English Flora for full particulars, inserting only

1. PEZIZA.—Receptacle more or less concave (cup-shaped), soon expanded, the disc naked.

TRIBE V. TREMELLINI.

Receptacle various in form, of a more or less gelatinous substance; spores at length bursting forth. For species *vide* 'English Flora'.

TRIBE VI. SCLEROTIACEI.

Receptacle various in form, more or less compact, fleshy. For species *vide* 'English Flora'.

ORDER GASTEROMYCETES.

Hymenium included within the
uteriform excipulum.

Tribe I. ANGIOGASTRES.

Tribe II. PYRENOMYCETES.

Tribe III. TRICHOSPERMI.

ORDER HYPHOMYCETES.

Tribe I. CEPHALOTRICHEI.

Tribe II. MUCORINI.

Tribe III. DEMATIUM.

Tribe IV. MUCEDINES.

Tribe V. SEPEDONIEI.

ORDER CONIOMYCETES.

Tribe I. TUBERCULARINI.

Tribe II. STILBOSPOREI.

Tribe III. SPORIDESMIEI.

Tribe IV. HYPODERMIEI.

With these latter orders and tribes, the present work has little to do, since they are essentially subjects for investigation, in which the naked eye fails. Those who can afford to

give thirty or forty guineas for an adequate microscope, will find here, as well as in the yet unsettled questions as to the reproduction of Funguses, an ample field for their curiosity. Having supplied these lists for reference, this is not the place to enter into fuller details; they will be given where they apply to each subject, in the descriptive matter accompanying the plates. We will proceed to the mode of collecting and examining specimens, with a view to ascertaining the species to which they belong, and naming the precise individual; but it must be remembered that the present work does not pretend to give an entire Cryptogamic arrangement; being merely illustrative; the student must therefore be provided with vol. v. of the 'English Flora' of Sir J. E. Smith, (being vol. ii. of Dr. Hooker's 'British Flora').¹

ON COLLECTING FUNGUSES.

A basket is in the first place needful, and if the student should leave home without one, a profusion of lovely and rare objects will be certain to strew his path; in which case there are but two alternatives, to dissect on the spot, always an imperfect operation, or to carry away the spoil in hat or handkerchief, when on arrival at home, a heterogeneous mass of caps, stems, &c., presents itself—*disjecta membra*! who shall assign to each its proper parts? We have known a fishing-basket turned to excellent account when fish were shy, but the best of the osier-woven family is a plate-basket or knife-basket, unlined, it should be about a foot and a half long by a foot wide, and six inches deep, with a partition length-wise, the handle should be made to fold down for the facility of slipping under a carriage seat, and it is more convenient for use without a lid; any green leaves will screen the contents; stiff fern-leaves are best to prevent specimens from injuring each other; place in this basket two tools, for taking up by the roots from the earth, or severing from bark of trees, equally efficacious, a long strong broad-bladed butchers' knife! start not, gentle reader, and a wrenching chisel! after much experience we find there is nothing too deep or too tight not to give way to these potent engines; the chisel should have an oval handle. Having cut deeply round the stem of an Agaric, Boletus, &c., at a sufficient distance to ensure the volva, if it have one, being uninjured, and you will find the knife cut easily through turf, insert the chisel, turn the ball

¹ Drawn up by the Rev. M. J. Berkeley, a hand-book, for which there is no substitute at present. And even if a much desiderated new arrangement of Funguses were completed and in the hands of the public, it would not change the nomenclature.

of earth out, and deposit it erect and steady in the basket. Now we have filled the basket, where shall we put the tools? if walking, it is a puzzle, but a double leather-sheath with a loop, to carry reticule fashion, is a good plan, at any rate have a sheath because coat pockets can then receive them.

In placing out the specimens at home, for leisurely examination, an iron tea-tray is a good thing for the purpose, as you can always keep the turf moist, by putting a little water into the tray; this is better than sprinkling the plants, but must be most sparingly done, as too much wet not only accelerates decay, but if you are anxious to depict any of the collection, you will scarcely recognize them when water-soaked, and the delay necessary to dry them again may be inconvenient. Many of the coriaceous kinds will swell out again after having been kept for months in a dry state, therefore attention must of course be paid to the most fragile first. If reserved for more than an hour or two, the specimen tray should be placed in the dark, to check too rapid development, and in a room free from currents of air.

TO ANALYSE THE CONTENTS OF THE BASKET.

A sharp knife, a pair of long slender surgeon's scissors¹ and a thin, lancet-shaped piece of ivory, are necessary adjuncts to the examination of the parts of Funguses. If the first object of attention be a pileated fungus, in its strictest sense, that is, consisting of a cap placed upon a stem, "Champignon" in French parlance, a "Mushroom" or "Toadstool" in English, look underneath the cap, to ascertain the configuration of the hymenium; if it have plaited folds radiating from the stem, it is an *Agaric*; if resembling a mass of fine sponge, it is a *Boletus*; if spinous points are seen, it is a *Hydnum*; if branching veins, a *Cantharellus*. It is an *Agaric*—point one, then, is determined; next we must ascertain the colour of the spores; for the colour of the *gill*, Withering's distinction, is none in fact, as the common Mushroom is pale pink while the spores are yet undeveloped, and their deep purple-brown tint, on attaining maturity, changes the colour of the gill. When the colour of the gills resembles shot-silk in effect, it is because the spores are of one colour and the membrane on which they are placed of another.

Place the *Agaric* in an upright position in a glass tumbler; in an hour or two, if nearly mature, a plentiful deposite of the dust-like spores will be ejected against the sides of the glass.

¹ Sharp-pointed scissors cut a delicate membrane much better than a knife; the piece of ivory aids in removing a veil, dividing delicate parts, &c., for inspection without risk of cutting or bruising, it should be almost needle-pointed, but *flat*, not round.

These may be white ¹ pale-rose ², reddish ochre, ferruginous or brown-purple; by these tints, the plant is ascertained to belong to a particular series; if you can afford to sacrifice the specimen, cut the stem clean away from the pileus with your long scissors, and place it, gills downwards, upon a watch-glass, you will procure a most lovely pattern of the gills formed by the fallen spores, and may afterwards reverse the watch-glass, gumming its edge down upon a piece of card, upon which to inscribe the name, as well as to protect the contents, and thus form a cabinet of spores for reference. Watch-glasses are not dear if bought by the gross. To return to our Agaric; however we may have obtained the spores, they are white, then we have determined point the second, and our researches to fix upon the individual must be restricted to the series with white dust, *Leucosporus*.

There are twelve species under *Leucosporus*, and a little practice will give the power of referring an Agaric to its proper place. If on breaking it, milky drops form, it belongs undoubtedly to *Galorrheus* (from γάλα *milk* and ῥέω to *flow*), and we have only to compare it with the members of that class, to find its name; if the veil which covers the gills in a young state, is like a spider's web, it will probably belong to *Tricholoma* (from θρίξ a hair, and λῶμα a fringe); if it have a striking characteristic, the ring well developed, and no volva, it is under *Armillaria*, (from *armilla* a ring) and so on; and if it had a volva or universal veil? great care must be taken to ascertain this by removing the soil carefully from the root, for sometimes an Agaric has, sometimes has not this appendage, and when it has, it is possibly hidden among the grass roots. This volva is a white purse-like membrane, thrown over the head of the young plant, and drawn in quite below the root in its most perfect form, Fig. *A*; afterwards the head of the pileus bursts through it in its upward growth, part of the volva still adhering to it in patches or warts, and part remaining sheathing the stem like the calyx of a flower—and here it is, our plant has a decided volva, *B*. It has too an inner veil, attached to the margin of the pileus and also to the stem, covering the gills. Now point the third is determined, for it is the subgenus of *Leucosporus*, *Amanita*, which has two veils, a universal veil (volva) distinct from the epidermis,³ and a partial veil, for so this membrane which at first was attached to the edge of the pileus, *D*., as well as to the stem, completely covering the gills,

¹ Among the *white* are one or two buff and one pale pinkish-purple; among the *brown-purple*, a few quite black; but these trifling exceptions do not affect the general classification.

² This colour is not a *pink-rose*, but a *diluted vermillion*.

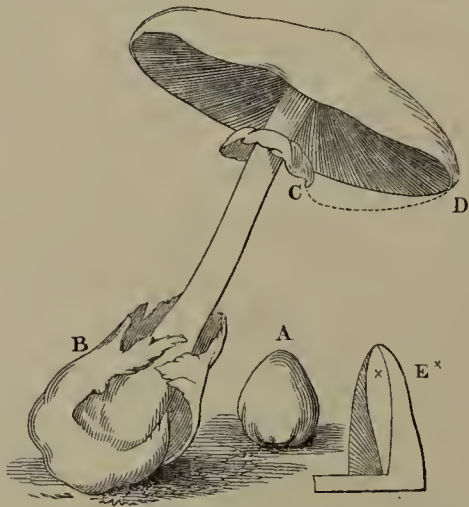
³ *Lepiota* has a universal veil, but it is confluent with the epidermis, attached to it in the form of scales, &c., except one portion which forms the ring; whereas, in *Amanita*, the ring is part of the inner veil, and not connected at all with the outer one.

is called; after it has been ruptured by the expansion of the cap, it forms a ring, round the stem, *C*. Now of the genus *Amanita* there are only three plants, among which to choose ours; for we know our volva is loose, remaining like a sheath, and in all the others, it is set down as obliterated. Characters are pointed out in these three applying to the margin of the pileus, 1, margin even: 2 and 3, margin striate: this means that the flesh being thin towards the margin of the pileus, the gills beneath cause an elegant ribbed appearance, but ours is smooth, *E.*, like the shell of an egg, then it cannot be Nos. 2 or 3, but is the first Agaric of the 'English Flora', one of the most perfect and elegant, and one of the most deadly; fortunately not common. There remains now only to verify the particular description, by making a longitudinal section, and however the young botanist may be perplexed with the novelty or difficulty of terms, no diffuse explanation gives half as good and determinate ideas, so that our first and last advice will always be,—acquire the terms of strict botanical usage.

Here are the botanical characteristics of our Agaric, extracted from the 'English Flora'.

“Volva¹ loose, margin of the pileus even.

“1. *A. PHALLOIDES*. Pileus more or less scaly, margin not striate, stem hollow above, volva bulbous. Pileus two to three inches broad, fleshy, at first hemispherical, then expanded or even slightly depressed, sometimes slightly umbonate, irregularly scaly from the fragments of the volva adhering to the surface, which is slimy when moist. The margin quite even and free from striæ; white, straw-coloured, olive-green, with brown markings, &c. Gills numerous, unequal, ventricose, broader in front, pure white, sub-adnexed, sometimes quite free; when young



A. Volva entire. B. Volva in maturity. C. Ring—remains of the inner Veil. D. Edge of Pileus to which the ring, C, was attached. E. Section showing the shape of gills.

covered with a membrane, which in the course of expansion either falls off or forms a deflexed ring. Stem three to four inches high, half an inch thick, fibrillose, with a few adpressed scales arising from the partial ring, which was at first in contact with it, attenuated upwards, bulbous below, and there furnished with a variously lobed volva which is adnate with the base of the stipes, but has the margin free and more or less expanded; in general hollow at the apex for some distance down, though occasionally the inner substance is only a little more spongy than the outer.”

¹ *A. volvaceus* of Bulliard has a loose, marked volva, but the spores are *purple-brown*.



Agaricus muscarius, Linn

PLATE I.

AGARICUS MUSCARIUS, *Linn.**Fly Agaric.*

Gen. Char. Hymenium consisting of plates, radiating from a common centre, with shorter ones in the interstices, composed of a double closely-connected membrane, more or less distinct from the pileus. Veil various, or absent.

Series LEUCOSPORUS.³Subgenus AMANITA.⁴

Subgen. Char. AMANITA. Veil double; one universal, covering the whole plant in a young state, distinct from the epidermis, at length burst by the protrusion of the pileus, part remaining at the base of the stem, part either falling off, or forming warts on the pileus; the other veil partial, at first covering the gills, and afterwards forming a reflected sub-persistent ring on the top of the stipes. Stem stuffed, at length hollow, squamoso-fibrillose, thickened at the base. Pileus with the disc fleshy, the margin thin, campanulate, then plane, viscid when moist. Gills attenuated behind, free, broader in front, ventricose, close but little unequal.

Spec. Char. AG. MUSCARIUS. *Pileus* from three to seven inches broad, convex, depressed in age, rich scarlet or occasionally buff brown or whitish, studded with conical, superficial warts; epidermis viscid when moist; margin striate. *Gills* broad, ivory white, ventricose, free or slightly adnexed. *Spores* white. *Stem* four to nine inches high, half an inch to an inch thick, stuffed, at length hollow, bulbous, the bulb scaly from the remains of the volva.

AGARICUS muscarius, *Linnæus, Berkeley, Sowerby, Withering, Purton, Vittadini.*

AMANITA muscaria, *Schæffer, Persoon, Greville, Gray.*

L'ORONGE fausse, *Paulet.*

Hab. Growing on the ground, not on wood; not soon decaying.

“The face of the country in general is thinly-covered with stunted trees, having a bottom of moss, mixed with low weak heath.”

Captain King is describing a favourite locality of the *Agaricus muscarius*—the wilds of Kamtschatka—and wherever a similar state of things prevails it may probably be found; climate has little to do with the matter, for it is a native of Italy as of Northern Russia, but where the rich loamy soil gives to our counties the distinctive title of “agricultural”, this, as well as many others of the Agaric family, will be sought in vain. Indeed, a general observation holds good, that the cultivation of the soil destroys these, its wild children; as the red man fades before the white, Funguses are obliterated by corn and potatoes. This is probably a reason why France and Italy produce this tribe so abundantly; many tracts of old forest-land in both countries lie in wild neglect, whilst in England nearly every available acre bears old furrow marks if not recent ones; so that though we may search our woods and heaths and discover nearly all the variety of the south as well as the north, they are scanty in quantity like their habitats. The untilled Highlands of Scotland abound in them, and there our present subject flourishes most profusely, although frequent in West Kent and Northern England.

¹ From ὑμῆν, a *membrane*, and μύκης, a *fungus*.

² From *pileus*, a *cap*.

³ From λευκός, *white*, and σπόρος, a *seed*. ⁴ From ἀμανίται, an old Greek name for Funguses in general.

This splendid Agaric lifts its head boldly, the “observed of all observers”, even the most careless so that it is oftener kicked to pieces, and other attentions of the kind bestowed on it, than most “Toadstools” receive; I have mourned over specimens nearly a foot across, their pure ivory gills and glowing scarlet pileus crushed in the dusty road. But I must confess it is but a meretricious beauty after all, so showy, so fair! looking so good! teaching us to distrust appearances above all examples among Funguses; the poor ugly sombre *Boletus edulis*, if we placed them side by side, would have no chance in outward comparison, but tried by the fiery ordeal of the gridiron, our ugly friend is as excellent an article of food as this lovely one is detrimental. Tasted raw, it is neither acrid, nor in any warning way unpleasant; the poison it contains is that principle called Amanitine, which is not dissipated by cooking, and is *the* poisonous principle of Agarics; other mischiefs arise from acrimony, or mere indigestibility, and are quite secondary.

Agaricus muscarius was so called by Linnæus, because, according to popular belief in Sweden, it kills the flies which settle on it; in France, Bulliard says, it did them no harm.¹ It is difficult to determine between these two great authorities, since in England at the time it abounds there are few flies to kill; but as far as observation went it had no effect—they did not avoid it. It has been recommended in doses of from ten to thirty grains for epilepsy, and externally as a dressing for ulcers. The expressed juice is said to purify furniture from noxious insects.

It is the Mushroom used by the Koriacs in decoction for their drinking festivities,² and does not kill them, although it produces delirious intoxication,³ and those effects which excite the Malay under the influence of other drugs “to run a muck”. Among the Tartars, the Moukhamorr is said to be worshipped; a more correct statement would be, perhaps, that it is an element in their worship, not its object. Under its Pythonic influence they are supposed to be divinely inspired and to speak oracles, and it is not impossible that its stimulating powers suggested the incursions of the Mongols into Europe. The mighty Alaric might owe his inspirations, not to brandy as some have said, but to Moukhamorr; and thus, from using it as a means to procure the divine afflatus, intoxication has become religion among the besotted tribes of Koriac Kamtschatka.

Agaricus muscarius can scarcely be confounded with any other British species. Bulliard takes great pains to discriminate between L’Oronge fausse (*A. muscarius*) and L’Oronge vraie (*A. Cæsareus*), but it would be superfluous here as we have not the *A. Cæsareus* in England. Withering believed that he had found it, but his *A. Xerampelinus*, so called also by Sowerby, is *A. rutilans* and belongs to a different subgenus. To recapitulate the principal botanical characters of *A. muscarius*:—“The plant rises out of the ground inclosed within the brown studded wrapper” (Withering), but it will be seldom detected in this state, as the wrapper or volva is destroyed when the plant begins to expand; the earth round old plants must be carefully removed, and the tiny buttons just peeping extricated; it now seems all bulb, with fibrous roots. The outer wrapper soon disappears, except the warts on the cap and the scales on the bulb, which are its corrugated remains; and the inner veil is seen, extended from the stem to the edge of the cap, covering the gills, and preserving them from all injury till the spores they contain are mature, at which time the expansive growth of the plant ruptures this veil also, leaving some fragments pendent from the rim of the cap, while the greater part remains attached to the stem, forming the ring.

¹ From a Russian friend: “Moukhamorr, in the Russian language, is the name given to poisonous Mushrooms, which are exactly like your drawing; the red-jacket Mushroom with white buttons, which is generally used in Russia to kill flies. They lay a little pounded sugar on the fungus, which the flies no sooner partake of than they die immediately. The pronunciation of the word is just as you have written it, and the literal meaning is ‘fly-killer’.”

² “Their passion for strong liquors has led them to invent a drink, equally powerful with brandy, which is scarce and dear, which they extract from a red Mushroom, known in Russia as a strong poison under the name of ‘Moukhamorr’.”—*Rees Ency. Art. Koriac*.

³ “Drunkenness among these people is a religious practice.”—*Rees, ibid.*



Geaster limbalus, Fries.

PLATE II.

GEASTER³ LIMBATUS⁴, *Fries*.*Multifid Starry Puff-ball.**Gen. Char.* Peridium double, outer distinct, splitting into rays.*Spec. Char.* G. LIMBATUS. Outer peridium coriaceous, multifid, expanded; inner subpyriform pedunculate, mouth fimbriato-pilose, depressed, sub-acute.GEASTER limbatus, *Fries, Berkeley*.—— multifidum, *Greville*.LYCOPERDON stellatum, *Hudson, Woodward, Sowerby, Withering, Purton*.GEASTRUM stellatum, *Gray*.*Hab.* On hedge-banks, in loose sandy soil.

The Geasters, or Starry Puff-balls, are not only interesting from their beauty and curious mechanism, but from their rarity; which is the cause of great inaccuracy in many descriptions of them, the accounts we have being chiefly traditions, handed down from one botanist to another since the time of Ray; not skilful discriminations from fresh specimens: when, therefore, a Geaster does present itself, the difficulty of identifying it is great. Nature has bestowed extreme care in guarding this Fungus from external impressions, not only having given it an outer peridium, or envelope, but also hygrometric properties, which in wet weather cause the volva-like case, which is of a consistence between cork and leather, to close over the delicate little ball inside⁵. It is obvious that many English seasons must be unpropitious to the growth of a plant needing all this protection, and which, even in its great-coat, chooses the most sheltered nooks for its habitat.

The summer of 1846, so genial towards all the Fungus tribe, was a favourable opportunity for the Geasters to venture forth. On the 28th of August a remarkable group of *G. limbatus* was found on a most sheltered hedge-bank (a site all observers have concurred in giving to it), which had been made with road-drift, forming a very loose soil. There were lying, their rays intersecting each other, and the small and weak pushed aside by the robust, eleven perfect Earth-stars, in a space not more than eighteen inches square; the remains of others were also found, making, in all, eighteen in that one spot. They were in

¹ From γαστήρ, the *stomach*, and μύκης, a *fungus*; hymenium included in the receptacle.² From θρίξ, a *hair*, and γαστήρ, the *stomach*; receptacle filled with floccose hairs, on which the spores are placed.³ From γῆ, the *earth*, and ἀστήρ, a *star*; Earth-star. ⁴ *Fringed*; with reference to the ciliato-fimbriate mouth.⁵ Perhaps all Geasters are hygrometric when young, only losing their sensibility with age, in which state the rays become flaccid and then expand still flatter on being wetted; as was the case with those mentioned by Sowerby.

various stages of growth; from the apparent bird's nest of grass and earth, just beginning to break into stellar rays, showing the egg-like ball inside, to the fully expanded star, with its points recurved towards the ground, and, owing to that change in position, becoming deeply and transversely cracked. When young, the unbroken ball lies below the surface, covered with a shaggy white coat, which grasps tightly all the grass-roots and leaves, and small gritty soil. Withering describes the external surface as "bright silvery white", but even in a dry state it is almost impossible to clear that of the specimens under consideration, from the foreign bodies they so tenaciously hold as part of themselves; probably to acquire the resistance of weight against the wind, which otherwise would blow them away when expanded. The long root, which the same authority mentions, as resembling that of *Geaster coliformis*, running into the ground and breaking from the sudden upward growth, I can find no trace of; not one of these specimens shows a sign of it, neither was anything like the withered root of one entangled in the masses accumulated round others, which from their confused growth must surely have been the case.¹

As soon as the yet entire ball of the *Geaster limbatus* rises above the surface, it splits at the apex, and the segments fall back, forming rays, which vary greatly in number, and are generally irregular. The most perfect specimens, however, seldom exceed five main rays, for the intermediate ones, though splitting away from these at the points, remain connected with them for some distance from the base. The hygrometric property is strong in the imperfectly expanded stars, but those fully recurved never resume their original position; probably because it is only in an unripe state that the closing up of the outer peridium, which has some resemblance to the calyx of a flower, is needful; when the seed is ripe for dispersion, this officious care would be an obstacle.²

The real Puff-ball (inner peridium or receptacle) is grey, top-shaped, the summit rather depressed, but in the centre the mouth rises, surrounded by minute corrugations; this mouth is composed, in general, of four segments, which are acutely pointed, beset with yellowish brown hairs (ciliated) and twisted into one cone; when the spores force an exit, the mouth is torn down on one side of the receptacle. Great attention must be paid as to whether this inner ball be truly sessile, that is, stemless, or only appears so, the stem not being seen in *Geaster limbatus*, till the thick outer coat has become completely recurved; the head is sunk between the high shoulders, but as they fall its neck becomes apparent, there is a very evident stem (peduncle) and the bottom of the little globe is drawn in to meet it; but there is no groove round the top of the stem, which is a distinguishing mark from another individual of the same family. The dust-like spores are rich brown, and very plentiful; situated on hairs (whence the name of the sub-order *Trichogastres*, to which it belongs), which hairs are firmly attached by one end to the peridium, and the other extremities converge towards a spongy pistil-shaped protuberance in the centre.

On making a careful section (which those feminine implements, scissors, will execute far better than a knife), the outer case will be found to consist of two layers of coriaceous substance; the upper layer being divided at the shoulders, to have dove-tailed between the two, the neck of the precious little ball they hold in charge (for precious it surely must be to merit so much care) and which is evidently of a totally different substance to its *quondam* envelope—now pedestal.

The outer case, although nearly colourless when dry, gives out, on being soaked in water, a rich brown stain and smells like dried tongue.

¹ Those Funguses which are sustained in their place by the attachment of similar cottony matter to dead leaves, &c., are destitute of a penetrating root generally, if not invariably. Still there is no doubt of our present subject being the *Lycoperdon stellatum* of this author, whose other remarks apply admirably.

² The contents of the receptacle were fully matured in all the specimens before its outer case expanded, and the mouth did not open for the emission of the dust till that expansion was complete.



Merulius lachrymans Wulfen

PLATE III.

MERULIUS LACHRYMANS,

The Dry-rot.

Gen. Char. Hymenium veiny or sinuoso-plicate. Folds not distinct from the flesh of the pileus, forming unequal angular or flexuous pores, not tubes.

Spec. Char. M. LACHRYMANS; effused, large, yellow, ferruginous or deep orange; *margin* white, tomentose; *folds* large, poroso-sinuate.

MERULIUS lachrymans, *Wulfen, Greville, Fries.*

BOLETUS lachrymans, *Sowerby, Withering, Purton.*

MERULIUS destruens, *Persoon.*

The ravages of Dry-rot, whether in the noblest ships of the Navy, or behind the wainscot of the little back parlour, are unfortunately too well known, having in recent times occasioned universal consternation; the practical wisdom of the builder, as well as the science of the architect, have been foiled by a Fungus, and the medicaments of the chemist employed to cure disease, which it would appear all timber "is heir to." Yet many old houses, composed almost entirely of wood, remain intact, their beams and wainscots enduring through centuries, never having betrayed a symptom of that latent evil, which now often demands the substitution of entirely new materials, before a mansion has been completed. On admiration being expressed of the oaken floors &c., in the ancient part of Knowle, "Yes," said the house-keeper, "but you cannot carry a lighted candle through these rooms"! Doubtless the horror we of the nineteenth century have of draughts, is one of the causes of mischief, as far as the erection of houses is concerned, but ventilation, though it may dry up mere boarding, could scarcely be sufficient to season a beam which had the rudiments of Dry-rot at heart. The ancient mansions of England were built with trees cut upon the estate with a view to their destination, and stripped of their bark in the spring, in preparation for being cut down the next winter;³ gentlemen in felling their old oaks, had not an eye to the tan-pit, which the timber-merchant has since found so considerable a source of profit. "Happy were it for our timber if some invention of tanning without so much bark were become universal, that trees being more early felled, the timber might be better seasoned and conditioned for its various uses"⁴.

The Romans, who took little account of the bark, cut the tree half through in spring, in preparation for taking it down the succeeding winter. Vitruvius, Columella, Theophrastus, Pliny, &c., have left many directions for guidance as to times and seasons, some of which may now cause a smile, but because we do not believe with them, that the age of the moon had any influence on the timber, we are not justified in throwing over the results of their experience as to its durability. "They considered the proper season to

¹ From ὑμῆν, a *membrane*, and μύκης, a *fungus*.

² From *pileus*, a *cap*.

³ This is, or was till lately, the system in the Forest of Dean.

⁴ Evelyn's 'Sylva', vol. ii. p. 208; by "more early felled", Evelyn means early in the year: January, or February.

be December, and unanimously pronounce that if then felled, it will neither shrink, warp, nor cleave, nor decay in many years". "If you fell not oak (says Evelyn) till the sap is in rest, as it is commonly about November and December, after the frost has well nipped them, the very saplings thus cut, will continue without decay, as long as the heart of the tree. And the reason of this is briefly given by Vitruvius, because the winter air closes the pores, and so consequently consolidates the trees; by which means the oak, as he and Pliny both express it, will acquire a sort of eternity in its duration; and much more so if it be barked in the spring, and left standing all the summer, exposed to the sun and wind, as is usual in Staffordshire and the adjacent counties (1690); by which we find by long experience, the trunks of the trees so dried and hardened, that the sappy part in a manner, becomes as firm and durable as the heart itself".—PLOT, *in Phil. Trans.* vol. xvii. p. 455.

The custom of felling wood in winter prevailed in England from the most ancient times, but the high price of tanners' bark introduced the custom of cutting down the trees in spring, thereby gaining the bark of the branches as well as of the butt, and saving some trifling expence in disbarking, which is more trouble when the tree is standing. Buffon advises that trees required for timber, should first be stripped of their bark, and left to die standing, the sappy part by this means becoming as hard as the interior, without cracking, warping, or decaying.¹

"It is the sap in the wood", says M. Necker, quoted by Bowden "which is the cause of its destruction; it heats, corrupts, reduces it to dust, and rots it before its time."²

In the year 1815, Mr. Bowden drew up a report to the government, on Dry-rot, and in corroboration that the sap, remaining in the wood, is the cause of the decay, gives much valuable information, and facts, as to the duration of various ships.

The 'Sovereign of the Seas', constructed for Charles I., was two years in building 1636-7, of wood cut in winter, having been barked the spring previous. After forty-seven years service, and figuring in several engagements, she was broken up, but a great part of the wood was so sound, as to be employed in building a second ship of the same name. The 'Royal William', 100 guns, built of wood barked in spring, and cut the next winter, was three years on the stocks, and was finished in 1719; after much hard work she was finally broken up in 1813, having lasted ninety-four years.

The "Achilles", a sixty-gun ship, built in 1757, in the short period of one year and two months (by Mr. Barnard of Deptford by contract, p. 137.) of timber barked in the spring while standing, and cut down in the following winter, after being in active service nearly six years, employed as a guard-ship about seven years, continuing in the West Indies (so destructive to ships) about two years, and lying up in ordinary thirteen years, making altogether a period of twenty-seven years and a half without being once repaired, is found on being taken to pieces, as sound as the first day she was launched p. 138,-39-40. Any doubts that may have been raised as to the partial repairs of the two before-mentioned ships, invalidating their claim to durability cannot apply to the 'Achilles', in which not a single timber had been replaced.

In the Royal Dockyards at that time there was an allowance to the providers of wood of this kind, to indemnify them for the loss of the bark; but that article rose so much in value, as to render the per

¹ "The supposed superior quality of the wood when winter-felled, and the general practice of felling oak timber at that season, may be inferred from a statute of James 1st. whereby it is enacted, that no persons shall fell, or cause to be felled, any oaken trees meet to be barked, when bark is worth two shillings a cart-load (timber for the needful building and reparation of houses, ships, or mills, only excepted) but between the 1st. day of April, and the last day of June; not even for the King's use, out of barking time, except for building or repairing his Majesty's houses or ships".—*Supp. Enc. Brit.*

² Neither M. Necker nor Mr. Bowden are to be considered as authority with regard to the natural history of Dry-Rot; but this does not affect the argument as to the sap left in the wood being its immediate cause; the mode in which the Fungus is germinated, is a question of botanical physiology for separate consideration.

centage paid insufficient. The last vessel, the 'Montague', built with this description of timber was launched in 1779 and in 1819 promised to become a centenarian, as the 'Royal William' had nearly done. These are facts, and speak for themselves; surely it was false economy not to raise the indemnity for loss of bark to its full extent; for ships have rotted unfinished since then.

The decay of wood from being placed in wet earth, or other similar causes, must not be confounded with the havoc made by *Merulius lachrymans*.

In the section of a piece of wood attacked by Dry-rot, a microscope reveals minute white threads spreading and ramifying throughout its substance; these interlace and become matted together, into a white cottony texture, resembling lint, which effuses itself over the surface of the timber; then in the centre of each considerable mass, a gelatinous substance forms¹ which becomes gradually of a yellow tawny hue, and a wrinkled sinuated porous consistence, shedding a red powder (the spores) upon a white down; this is the re-supinate pileus, the hymenium being upwards, of *Merulius lachrymans* in its perfect and matured state. Long before it attains to this, the whole interior of the wood on which it is situated has perished, the sap vessels being gradually filled by the cottony filaments of the Fungus; no sooner do these appear externally, than examination proves that the apparently solid beam may be crumbled to dust between the fingers²; tenacity and weight are annihilated; cure, not only there is none, but there never could have been, as the evil is not known till it is final.

And how came Dry-rot there? It was in the sap when the tree was felled. It found in that sap, perhaps the fermenting principle that called it into life, certainly the nutriment propitious to its growth, and so it fed and flourished till it usurped the very place of the wood which fostered it.

But how came the *Merulius lachrymans* to be latent in the sap? This subject is as yet dimly understood; modern microscopes aiding that patient research which seeks to arrive at truth by inductive means, instead of theorizing on defective data, may be expected to prove, what at present is only probable³

This then is probable. In ancient forests, where a succession of trees flourished and decayed, millions of the spores of Funguses must have been scattered, and carried to the earth by rains. These impalpable dust-like bodies would be absorbed along with the moisture by the roots of the trees, and carried into the sap-vessels, being so minute as to circulate easily through them. Here then are the elements of parasitic life, whenever fitting opportunity occurs.⁴ This opportunity is afforded, when the energies of the tree are weakened by age, and the circulation languishes; to an analogous state a vigorous tree is reduced by felling.

Fistulina hepatica and various species of *Polyporus*, divert the feeble current of life in the dying trunk, to their own active growth, and if, in the sap of the cut timber, spores of *Merulius lachrymans* should be latent, it will evolve that Fungus, being no longer necessary to the tree itself.

So far the analogy between the felled and the decaying trunk, is, that both submit to a parasitic growth at their expence; but it is probable that beyond this passive mode of fostering such growth, the sap of the

¹ In this state it sometimes distils drops of water, whence its name—*lachrymans*.

² "Architects also know that beams are sometimes taken from old houses so much decayed in the middle that they could thrust their arms into them from either of the ends, while at the same time the beams have been apparently sound on all their sides."—*Bowden*. p. 17.

³ "The perfect plant may be produced from the seed, carried up into the longitudinal tubes of a growing tree, by the rising of the sap! though it would seem that the process of vegetation in the parasite thus lodged, will not commence, so long as the vital principle of the sap in the tree remains in activity. Indeed it is pretty evident, from numerous observations, that the process of fermentation is necessary to the growth of all Fungi."—*Suppl. to Ency. Brit.* Also *vide* Badham on 'The Esculent Funguses of England', and a paper by Mr. Berkeley, on Bunt, *Journal, Hort. Society*, March, 1847.

⁴ Persoon says that we may suppose the reproductive bodies of Funguses innate in different plants, according to their nature, and waiting till a malady, or even the destruction of the vegetable (or tree) favours their development. He elucidates this by the presence of Entozoa in sickly animals.

vigorous tree, by fermenting, actively assists it¹; the venerable old monarch of the forest, decayed at heart, is the prey of large external Funguses; not Dry-rot, which is brought into being by the more restless agency left to work in the prostrated, but not yet defunct "stick of timber".

Had the sap been suffered to descend before the oak was felled, it would not in all probability have left behind this embryo pest, which was circulating with it; at any rate, the food for its nutrition would not have been there; the proper season therefore for taking down timber, is clearly after the fall of the sapless leaf, not when every one of its pores is filled with an active power for evil or for good, provided to impel forward new foliage but perverted into dry-rot. Such timber it is not possible to exsiccate by any after care; the only thing that can be done is to substitute some poison, by saturation, for its proper juices, or to force them out by tremendous pressure. This latter alternative however has the disadvantage of rendering the wood too solid.

If noble oaks are doomed, "when ripe for the harvest" let them be taken down in January, without any reference to the tanner; such timber warranted would always command a market, and deficiencies in bark may be supplied from Australian or chemical resources.

Charring affects only the external surface. "Although, says Persoon, the Fungus tribe love humidity they are never found under water"². Immersion has been proved to be an effectual preventive of Dry-rot and that not necessarily in salt-water, to which the permanent dampness it gives, is an objection. Probably a lengthened immersion substitutes water for the sap entirely; it is said that the timber for threshing-floors and the wainscoting of old mansions was formerly soaked in running streams, with the butt end towards the current, so that the water was injected throughout the whole length of the sap vessels. The mode of preparing timber for masts, is to keep it in mast-locks, and one taken out of the mud in Deptford dockyard, where it had lain for fifty years, was used for the Kangaroo sloop of war and proved most serviceable. At Brest, where dry-rot is unknown in ship-building, all the timber is kept in a creek of the harbour. Might not this principle of seasoning be applied more generally, and in houses? All timber is not equally prone to decay from dry-rot, some trees, even though full of sap when cut, never showing a symptom of it; there are therefore soils and situations exempt from the spores of *Merulius lachrymans*; but, whether or not its germs are in the tree, cannot be detected while it is yet sound. It is probable that open airy plains will furnish the most healthy, close dank woods the most diseased, timber. This was the belief of our forefathers; Plot goes so far as to recommend that no timber grown among underwood or coppices should be bought for the king's Yards.

¹ The half-built vessels were stove-heated to dry them faster, when the growth of the Fungus was materially accelerated; a result the botanist would have anticipated, though the carpenter did not; as the effect was to apply the hot-house system of forcing.

The cupidity of quacks often interfered to prevent the truth being elicited. In the article 'Dry-rot', in Rees' Ency., drawn up apparently by a practical builder, it is gravely stated that one Mr. Johnson found out that Dry-rot was caused by a plant like a vine, the leaves of which he kept to show. Wherever this fell plant touched it poisoned the wood, and, hydra-like, sprouted when deemed dead!

² It is well known that although dew, and electric showers promote the growth of the common Mushroom, heavy cold rains destroy the spawn, "they drown it" says an experienced Mushroom gatherer.

Now that so many labourers cannot find employment in winter, the taking down trees at that time may be true economy, and save in poor-rates what is lost by stripping the trees standing.



Cantharellus cibarius, Fries.

1880

1880

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PLATE IV.

CANTHARELLUS¹ CIBARIUS, *Fries*.*Esculent Chanterelle.*

Gen. Char. Pileus furnished below with dichotomous radiating branched sub-parallel folds, not separable from the flesh, sometimes anastomosing or obsolete.

Spec. Char. C. CIBARIUS; entire plant rich yolk-of-egg yellow, pileus fleshy, firm, smooth, sub-repand, lobed, depressed, the margin vaulted, from one to four inches across; folds tumid, distant; stem solid, attenuated downwards; spores pale ochre, nearly white.

CANTHARELLUS cibarius, *Fries, Berkeley, Greville, Roques.*

AGARICUS Cantharellus, *Linnaeus, Schaeffer, Bulliard, Sowerby.*

MERULIUS Cantharellus, *Withering, Purton, Persoon.*

GIROLLE ordinaire, *Paulet.*

Hab. Borders of woods, particularly under oaks.

Chanterelles were formerly classed with the Agarics, and at first may be mistaken by the inexperienced for members of that genus, but very slight attention will show wherein they differ. In place of the gills, which in Agarics resemble the plaits of a fan, a Cantharellus has folds, disposed in the same manner, but much shallower, resembling veins, swelling out (tumid), instead of the sharp edge of the plaited gill; these folds or veins moreover, are of the same substance as the stem and cap, you cannot pull them away without tearing the flesh; whereas the gills of an Agaric are composed of a membrane distinct from the rest of the plant.

The *Cantharellus cibarius* is very irregular in form; in a young state the margin of the pileus is rolled in towards the stem, so as to resemble a turban; as it expands, it becomes variously lobed, depressed in the centre like a wine-glass (infundibuliform), the stem generally turned on one side by the unequal growth of the pileus, but not truly excentric; it is of one uniform hue, that of an orange apricot, and possesses the delicious fragrance of that fruit, or of a ripe green-gage; for this reason it is one of the esculent Funguses most easily discriminated, and concerning which there can be no uncertainty when once the collector has formed its acquaintance, for no other variety of the genus has this peculiar scent; nor indeed has any other fungus been noticed to possess it. The cap, which becomes in a degree bleached by exposure to the air, is not viscid although perfectly bald and shining, this was once considered a sure difference between it and *C. aurantiacus*, said to be dangerous; but M. Klotzsch found specimens of that, in the Highlands, which were smooth also, so this condition must not be depended upon to ensure the goodness of a Chanterelle, although the converse, having a cloth-like nap (tomentose) or locks of cottony fleece (floccose) or scales (squamosae) must be instant signs of condemnation for the individual possessing them; apart from esculent

¹ From *κάνθαρος*, a vase, or cup,—a shape the pileus often assumes.

considerations, however, two of these rejected ones are worthy of notice, being rare; and *C. aurantiacus* is elegant, its folds are very fine and close, and repeatedly branched, in *C. cibarius* they are wide apart, and swelling, with many cross wrinkles between.

Persoon, speaking of this Chanterelle, says "there are places where the inhabitants make it their principal food". In England it is not common, although in a few spots, an abundant supply may be sometimes met with. It loves elevated woods, under oaks, where at intervals it may be found during the whole period from Spring till Autumn; it affects the "ring" style of growth, and on the open borders of old woodland, may be generally traced in a circular form; it also grows irregularly among heathy underwood, but never in rank grass nor where the ground is wet from the dripping of trees, or decaying vegetation; (a favourite habitat, according to Persoon, for the *C. aurantiacus*, and to which he attributes its deleterious qualities). Sowerby says it is found frequently in fir woods, and he knew, and has figured it well, so that no doubt it is so, although our own experience has not verified the fact. Its excellence as an article of food we have personally verified, making it a point of conscience not to recommend in the course of this work, any Fungus which has not been fully tried upon our own constitution; tastes may differ as to what pleases the palate, but unless we can add, "perfectly wholesome" no commendation shall be bestowed. Our testimony then as to *Cantharellus cibarius* concurs with that of the French, Austrian, English and Italian authorities which Vittadini winds up with a superlative "sapidissimus". Some of the continental writers hint, that it is not quite the thing raw, but a meal of any crude vegetable is a hazardous experiment upon English digestion; none need hesitate to partake, when cooking has rendered it tender. Trattinick asserts "not only this same Fungus never did any one harm, but might even restore the dead"!¹

This being the first we notice of the esculent kinds, two observations, which apply generally, will not be superfluous. In the first place then they should be brought from their site direct to the kitchen, when, if the period of sending them to table must be deferred beyond a few hours, they should be half-dressed, (thoroughly heated through, so as to check decomposition) and warmed when wanted. Secondly, never allow any to be used (unless Mushrooms for ketchup) when the larva of insects appear on cutting them across, for then, although the nicety of appetite should not revolt, they are undergoing an incipient change towards putrefaction, which is likely to be prejudicial.

As far as our *Cantharellus* is concerned, it is very persistent, no external signs of decay manifesting themselves, till the plant is much past its prime; reject therefore tough, flaccid, light specimens, selecting only such as are crisp and comparatively heavy. These are not of a proper consistence at any time, for broiling, but must be stewed in gravy or fricasseed.

And now to generalize a little as to cooking these delicate articles, of whatever species they may be. When gravy is recommended to stew them in, a clear brown veal gravy, not so much flavoured as to destroy the native taste of the Mushrooms, is meant. Aspic gravy, as for jelly, is a very agreeable medium if the acid flavour is not disliked. When to be fricasseed, a delicate white sauce mildly seasoned is the vehicle; in either case after washing and removing the stems, reduce the subjects to one uniform size, by cutting across; put the pieces into a closely covered saucepan, with a little fresh butter, and sweat them; (this is a term in cooking for which even Mons. Ude could find no elegant substitute; it means that the substance being gradually and gently warmed, should part with its own watery juices, while imbibing the butter); take them out, wipe, and either stew in gravy or fricassee them till tender; this must be done at the lowest possible temperature, many of the most exquisite Funguses losing their volatile flavour under the action of great heat.

¹ "Man pflegt diesen Schwamm aller Orten zum Gebrauche der Nahrung anzuwenden, und es ist noch kein Beyspiel bekannt, dass je ein Mensch durch ihn oder auch durch eine Verweckslung mit demselben wäre vergiftet worden."—*l. c.* p. 98.

Pl. 17.



Boletus subtomentosus Linn

Rare in inf

PLATE V.

BOLETUS SUBTOMENTOSUS,

Gen. Char. Hymenium distinct from the substance of the pileus, consisting of cylindric separable tubes. Spores oblong. BOLETUS,—from βῶλος, a *ball*, from the rounded form of many of them.

Spec. Char. B. SUBTOMENTOSUS; pileus pulvinate, dry, subtomentose; tubes adnate, large, angular, simple, pale yellow; stem, firm, even.

BOLETUS subtomentosus, *Linnæus, Berkeley, Fries, Greville, Persoon, Purton, Trattinick.*

BOLETUS cupreus *and* crassipes, *Schæffer.*

BOLETUS chrysenteron, *Withering, Bulliard.*

BOLETUS sanguineus, *Withering.*

Hab. Borders of woods, and particularly under oaks in parks, in sub-alpine districts. Summer and early Autumn.

Cylindrical tubes, nearly parallel with the stem, contain the spores of the Boletus in place of the horizontally plaited membrane which forms the gills of an Agaric. These tubes are, like gills, of a different substance from the pileus, and may be easily pulled away from it; as gills are sometimes simple and sometimes forked, so the tubes are either simple or branching into several orifices (compound), which is ascertained by making a section of them.

The Boletus is the Suillus of the classics, the Porcino of modern Italy, the Cèpe or Potiron of France, and the Toadstool, *par excellence*, of England. The stuffed cushion-like (pulvinate) pileus appearing to vulgar eyes fitting throne for such occupant as the “loathely paddock”; who, poor thing, if he ever did venture on so much assumption, would be likely to topple down from “slippery places” as higher ambition does. It must be confessed that some of the Boletus tribe require the enthusiasm of a devotee to transform them into touchable objects; but this is not the case with the individual now selected, which has nothing repulsive, if nothing strikingly beautiful about it; and is sufficiently distinct in character to be easily recognized.

Boletus subtomentosus is so named from the minute down which covers the pileus, giving it the texture of a Limerick glove; it is not glutinous in any stage of growth; the size is variable, but averages two inches across; the shape irregular, inclining as frequently to the square as to the circle, resembling a stuffed pin-cushion; it is frequently cracked in a tessellated manner, but never scaly. The colour varies, the ground shades being pale olive or yellowish, but the sun gives the exposed parts a red blush, as it does to a peach. The pores, or orifices of the tubes, resemble pale yellow sponge, and are much larger in proportion to the plant, than in many of the gigantic species; where the fingers bruise them they turn blue-green, so do the tubes in making a section; and the flesh, which is yellowish white, becomes blue as the air acts upon it, but fades again. The tubes are simple, the third part of an inch long, adnate to the stem, or subdecurrent,

running a little down it; the spores pale drab-colour. The stem is from two to three inches high, and half an inch or an inch thick (in which proportions it differs from most of the species, which generally have very clumsy stems), it is smooth, firm, streaked with red, seldom quite straight, being scarcely ever solitary, but growing in pairs or even threes, so as to force the stems out of the perpendicular. The *Boletus sanguineus* of Withering, is only a peculiarly crimson state of this Fungus, forming a variety which may mislead the inexperienced, (and indeed he considered it a novelty), but having no essential botanical distinction, mere colour not being allowed to be such, since we talk of a white pink, and white roses, as well as deep purple ones. The accidents of soil, exposure to sun, or want of it, cause such differences in the mere external appearance of all Boletuses, as are well calculated to try the powers of observation possessed by the student. Sometimes in age they are completely over-run with another species of minute Fungus, *Sepidonium chrysospermum*, which veils the whole plant and penetrates to its very heart, converting it into a mass of golden dust, this dust consisting entirely of spores; similarly enveloped in a white parasitic garb, an "old friend may present itself in an entirely new dress"; indeed, during the past summer and autumn, those of 1847, so rapid was the developement of all Fungus growths, that it was rare to find the Boletus tribe in perfection, they were water-soaked like full sponges, and rapidly became the prey of the various Mucors, which attacked them; to prepare such specimens for keeping was impossible, as they not only contained a most unusual quantity of humidity, but abounded in weather when the humidity of the atmosphere precluded their drying, giving a lively impression of the difficulties attending the formation of a *hortus siccus*, in Brazil, complained of by Mr. Gardner.¹ The *Boletus sanguineus* is not recommended for the table even abroad, and should be shunned in England as doubtful at least. Any unwholesome qualities of the tribe in general, however, appear to be fugitive, and lost in drying. Pliny says they should have rushes passed through them, and be suspended in the air; thus preserved they are an article of consumption in Italy, where no species is rejected; and they are in constant demand as a marketable commodity, so that collecting and preparing them employs many hands.

Old Gerarde, in speaking of Funguses, says, "many wantons that dwell near the sea, and have fish at will, are very desirous for change of diet, to feed upon the birds of the mountains; and such as dwell upon the hills or champain grounds, do long after sea fish; many that have plenty of both, do hunger after the carthie excrescences called Mushrooms." It is notorious that the skill of cooks has ever been taxed to invent fast-day substitutes for flesh, when fish palls on the dainty appetite, and what so like a veal cutlet as the tender and delicate *Boletus edulis*? *Agaricus deliciosus* cannot be distinguished from a savoury kidney when similarly served up; and not to multiply examples, as all will be noticed in the proper place, there can be no doubt that in Roman Catholic countries the edible funguses are a most grateful addition to meagre diet. For the invalid, restricted to a wearisome monotony of light messes, in which meat may form no part, a change is suggested which many will be thankful for. *Probatum est.*

Take a small quantity of parsley and sweet herbs and if not medically prohibited, a little carrot, scald them in boiling water, and throw it away, as putting butter to them may be objectionable, then add a little sugar, and as much mushroom ketchup as gives a pleasant flavour of soup, thicken it with arrowroot, so that it will hang a little to the spoon, and throw some dice of toasted bread into it.

All weak mutton or chicken broths are much improved by ketchup, but it is a hazardous article to purchase.

¹ "Travels in the Interior of Brazil, principally through the Northern Provinces and Gold and Diamond District, during the years 1836-1841, by George Gardner, F.L.S." The narrative of an intelligent naturalist whose heart was in his occupation.



Polyporus intybaceus, Fries.

PLATE VI.

POLYPORUS INTYBACEUS, *Fries*.

Gen. Char. Hymenium concrete with the substance of the pileus, consisting of sub-rotund pores, with thin simple dissepiments. POLYPORUS,—from πολλῶς, *many*, and πόρος, a *pore*.

Spec. Char. P. INTYBACEUS; Very much branched, each division of the stem terminating in a dimidiate pileus from a half, to one inch and a half broad, rugose, downy, brown-grey, more or less zoned; pores white, turning ochre-brown when bruised, extremely shallow, not decurrent. Forming tufted masses from one to two feet across, and about eight inches high. August and September.

POLYPORUS intybaceus, *Fries*.

POLYPORUS frondosus, *Schrank, Klotzsch, Berkeley in Eng. Flora*.

POLYPORUS frondosus, *bouquet des Chênes*, and POLYPORUS multiconcha, *Polypore coquiller*, *Paulet*.

BOLETUS frondosus, *Polypore en bouquet*, *Persoon*.

BOLETUS frondosus, *Sowerby (not of Withering)*.

Hab. In turf at the foot of ancient oaks, but not growing immediately from the wood.

The ancient forest districts known as the Vosges and Ardennes, produce abundantly this peculiar and beautiful fungus; there the grey “cock of the woods” still crows in undisturbed regality, and from the resemblance *Polyporus intybaceus*, seated among the grass at the foot of a tree, bears to his wife while she is brooding over their progeny, it is not unaptly called “La poule qui couve;” but we must by no means confound our “couveuse,” the grey grouse hen, with the flaunting belles of the farm-yard; sober grey-brown, relieved with zones of a deeper shade, is the only colour the pileus ever displays, while the under surface is snowy-white, like the bird’s down, when she angrily elevates her feathers.

In England this plant is rare, and apparently not so luxuriant in its development as in Hungary, and the Rhenish forests, where it attains an immense weight; but it is so firm and compact that the relative bulk is not as great as might be expected. The accompanying drawing is the precise size of a specimen which weighed nearly six pounds; it consisted of three “bouquets”, united at the roots, and deeply imbedded in turf, at the foot of an ancient oak. Considered separately, each bouquet is arranged in the rosette style, and consists of a great number of petal-like fronds, growing out of, and “their bases confluent with, the compound stem” (*Fries*), in common parlance, “like a cauliflower.” The minor stems are convex on the under, and flat on the upper surface, with a central depression from the dimidiate terminal fronds¹; they are perfectly smooth and free from pores, which appear only on the under side of the pileus, and are mere depressions in the substance of the hymenium, not the orifices of tubes which this *Polyporus* does not possess, even in old age.

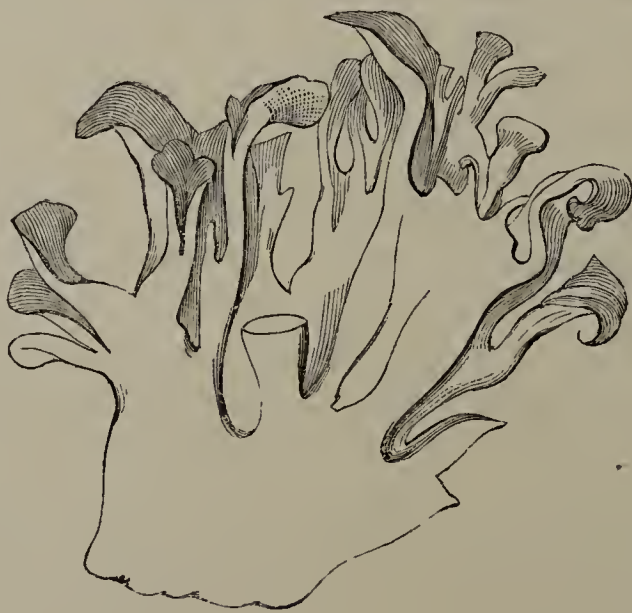
Paulet, whose figure is extremely good, thus describes his “Coquilles en bouquet.” “These plants are very remarkable from the number of their pilei (*chapiteaux*), disposed on a single foot, like shells, one over the other but without touching each other; also by the size and weight of the plants, sometimes above forty

¹ *Persoon* says that *Boletus ramosissimus* of *Jacquin* and *Schoeffer*, differs from our present subject in the pileus not being dimidiate; dimidiate means proceeding from one half of the stem; not growing all round it.

pounds, so that one will suffice for the repast of a numerous family. It represents a small bush garnished with shells, about fifty shells on the same stem, the entire plant being a foot across, and nearly as much high; one homogenous substance, the flesh very white, firm and brittle. The under side of the shells appears pricked with a pin and 'criblé de petit pores', which are not deep, but very apparent", (Traité des Champignons) Paulet. On account of the large size of these pores, Fries calls our present subject *P. intybaceus* to distinguish it from a variety with small ones, for which he retains the name *frondosus*; the latter is at present unknown in England. Some confusion exists between this and *P. giganteus*, but they can scarcely be mistaken for each other when living specimens have been compared. The synonymes given by Persoon, etc., are confused, and therefore in the present case none are admitted that are not undoubtedly correct. The figure in Sowerby's Fungi is very unlike nature: a rare fault in that monument of patient industry. Withering's *Boletus frondosus* is probably *Polyporus giganteus*; by giving a portrait of the latter shortly, and pointing out the differences between it and the present subject, inexperienced collectors may be guarded against mistake; at present one important difference will suffice.

On removing the grass-roots &c., it will be found that the blunt solid stem of *P. intybaceus* is carried up two inches or more, and quite clear of them, before it begins to ramify; this is shown in the section, and is a distinction peculiarly belonging to this plant, for though *P. giganteus* has many large leaf-like divisions proceeding from a common centre, they are not "confluent with a common stem", as is the case here. *P. giganteus* also will be found to proceed directly from decaying stumps, whereas *P. intybaceus* has no decided connection with them.

No fungus is more highly esteemed as an article of food than this. Eaten raw, the taste is very agreeable, but it leaves a slight astringency upon the palate. The directions for cooking the *Cantharellus* apply strictly to it; but possessing no peculiar flavour, which would suffer by foreign admixture, a bouquet of fine herbs as for omelettes, may be added to the gravy. It is usually fricasseed, with some eggs in the sauce, and must be a very desirable fast-day dish. It may however be noted, that whereas in eating most funguses, we select the pileus, and throw away the stem, in the present case the choice is reversed, the fronds, at least their extremities, should be trimmed off, and the solid white stems sent to table. The accounts handed down of funguses which were a load for a wain, apply, not to such as have a central stem surmounted by a single pileus, 'mushrooms' so monstrous could have suited none but Titanic feasts, but to this *Polyporus* or some of its congeners, consisting of a "buisson", as Paulet styles it, of "chapiteaux".





Boletus luridus, var. *h. Eries*

PLATE VII.

BOLETUS LURIDUS, var. β . *Fries*.*Crimson-pored Boletus.*

Gen. Char. Hymenium distinct from the substance of the pileus, consisting of cylindric separable tubes. Spores oblong. BOLETUS,—from $\beta\omega\lambda\omicron\varsigma$, a *ball*; from the rounded form of many of them.

Spec. Char. B. LURIDUS, var. β ; “Pileus thick, pulvinate, soft, smooth, glaucous buff or whitish; *tubes* yellow, their orifices minute, unequal, sanguine-red, rarely orange-red; *stem* short, ventricose, stout, reticulated with yellow and red; *flesh* changeable, turning blue; taste sweet.

“BOLETUS luridus, β . *Fries*.

“——— rubeolarius, β *sanguineus*, *Persoon*.

“——— Satanas, *Leny*.

“——— marmoreus, *Roques*.

“Satanspilz, Blutpilz. Pileus eight inches or more across, pulvinate, soft to the touch, naked, dry, in damp weather slightly viscid, smooth, seldom rough; wrinkled, tessellated in dry weather; whitish, leather-buff, or greenish, often shading into a red tinge. The flesh is solid, becoming soft, tender and juicy, from one to two inches thick, white, when broken turning first reddish, then blue. The mass of pores is in youth very shallow, afterwards deep; in the early stage they are yellow, then orange-red deepening to dark cardinal-red orifices; they separate easily from the pileus, and are dark blue when broken; they are not half as deep as the thickness of the flesh. The stem is without a veil, two or three inches high, thick, stout, nearly bulbous, often pressed flat or squared, often swelling out in the middle (ventricose), smallest above; yellow, blood-red or purple-red, seldom pale or rose-red, finely reticulated above, the reticulations purple-crimson, often vanishing in age, the stem growing streaked below. It differs from the common *B. luridus* in the shape of the pileus, and in the fine network of the stem”.—*Krombholz*.

Hab. In pastures under oaks; summer and autumn.

The *Boletus* family appears to have been less examined and described than any other division of the *Pileate* tribes; it seems therefore advisable to bring forward the most interesting subjects that have come under our personal observation, and whenever they can be thoroughly indentified with foreign illustrations, particularly the superb and laborious ones of *Krombholz*, a step will be gained in ascertaining the number of English species. The *Boletus luridus* of *Schœffer*, of which *Fries* considers our present *Satanspilz* a variety, is common in England, but few persons probably have seen the magnificent Fungus, which bears this German name of terror. It is certainly nearly allied also to *B. erythropus* of *Fries*, but *Krombholz* points out distinctive characters in all three which will scarcely allow of their being the same plant; a portrait of the undoubted *B. luridus* of *Schœffer* (and the English Flora) as well as one of *B. erythropus*, shall shortly be presented, when by comparing the three it may be possible to determine whether they are distinct individuals or the same, in masquerade habiliments. All will surely agree that had the description of *Krombholz*, which we have adopted, been drawn up to suit the portrait, it could not more correctly have applied to it;

and although for the sake of consistency in nomenclature we adhere to that of Fries, *sanguineus* is certainly a far better designation than the one inscribed beneath it. The particular Fungus from which this drawing was made grew in Hampshire, near Avington, a soil and climate which are particularly favourable to their developement; in full maturity the mass of tubes becomes much deeper, and more convex; the whole Boletus darker than in the plate, which is of medium age and its spores have not as yet distended the tubes, nor coloured them, as they do in ripening.

It would be rash to try experiments upon Satanspilz as an article of consumption; we have never eaten it. Its relative, *B. luridus*, is decidedly poisonous; neither of these fortunately can be confounded with the esculent Boletus, which at no period has the slightest red, among its various shades of colour.

At the risk of being charged with repetition by the learned, it will be better for the ignorant that the Boletus of modern Mycology should have its peculiar characters again defined, more particularly as the student, if the library at his command contain any works upon the subject at all, will be certainly puzzled by finding that Withering, Sowerby, Purton, Relhan, &c., in short all our English authorities, with the exception of Gray and of Mr. Berkeley's contributions to the 'English Flora', which are conformed to Fries' 'Systema Mycologica,' follow Linnæus, and unite Polyporus, &c., with Boletus. The following extract, therefore, from Vittadini, can scarcely be deemed superfluous. "All those Funguses with soft flesh, are called Boletuses, which have the under surface of the cap covered with vertical, cylindrical, or angular (poliedri) small tubes; slightly connected with each other, and with the substance of the cap; open below, and internally lined with a fructiferous membrane. The Boletuses have a central stem, often reticulated; the cap always horizontal, determinate, particularly fleshy, hemispherical or plano-convex. Many among them are furnished with a partial veil more or less apparent.

* * * * *

"Linnæus under the generic name of Boletus assembled promiscuously, all the fleshy, coriaceous, or corky Funguses provided with tubes or pores. Schœffer, Bulliard, Persoon, and many other distinguished botanists followed his example; whereas Fries in his 'Systema,' following the steps of Dillen and Micheli, retained, under the name of Boletus, only the soft-fleshed species, having tubes connected together, that is, the true Suilli of the ancients, strikingly illustrated by that same Florentine mycologist (Micheli) and he (Fries) comprehends the others in the genera Polyporus and Fistulina".¹

¹ Vitt. Descrizione dei Funghi Mangerecci. Page. xxxvii.



PLATE VIII.

AGARICUS SQUARROSUS, *Müll.*Series DERMINUS.¹

Spores ferruginous: veil not arachnoid.

Sub-genus PHOLIOTA.²

Sub-gen. Char. PHOLIOTA; veil dry, forming a ring which is sometimes membranaceous, sometimes radiato-floccose. Stem more or less scaly. Pileus convex, at length more or less plane, not umbilicate. Gills unequal, juiceless, changing colour. Spores ferruginous or fulvo-ferruginous.

Spec. Char. AG. SQUARROSUS; caespitose, *pileus* fleshy, dry, bright ferruginous-saffron or tawny yellow; *scales* close, revolute; *gills* pallid olive then ferruginous, broad, adnate or subdecurrent; *stem* squarrose, attenuated below pithy in the centre; covered with reflexed scales below the ring, above it smooth and pale.

AGARICUS squarrosus, *Müller, Persoon, Fries, Berkeley.*

———— floccosus, *Schæffer, Sowerby, Purton, Greville.*

La coulemelle herissée, *Paulet.*

Hab. In dense tufts on, or at the root, of trees; autumn.

Those melancholy persons in whom Funguses produce disgust, would feel an instinctive dread of the one now represented; thrusting forth a snaky mass of heads from the stump of a decaying tree, with strange flexuous serpentine stems, and bristling scaly coat, it is a decidedly repulsive individual. Tasso's description of the serpent which attempted to deter Charles and Hubert from their quest of Rinaldo, in the enchanted island of Armida, may be applied very appropriately to the Agaric we are now considering.

“Ma esce, non so donde e s'attraversa
Fiera serpendo orribile, e diversa.

Innalza d'oro squallido squamose
Le creste, e'l capo; e gonfia il collo d'ira:

* * * * *

Or rientra in se stessa, or le nodose
Rote distende, e se dopo se tira.”

La Gerusalemme Liberata, Canto XV. 47.

Surely this is as fit associate for witches, bats, and owls, as any of its brethren can be, and its “very ancient and fish-like smell,” by no means improves the impression received through the sight. It grows at the root of ancient trees in general, though sometimes higher up in the cavities of the decaying trunks. From one central point a tuft of stems proceeds, united at the base, where they are attenuated and compressed into a very dense mass; as the plant extends, they become variously bent from their direct course of growth,

¹ From δέρμα, *skin*, or *membrane*.

² From φολίς, a *scale*.

the expansion of the stronger members of the family pushing the weaker aside. The fully matured pileus is from one to five inches across, firm, convex, then expanded, obtusely umbonate (like the boss of a shield, *umbo*). It is never glutinous or slimy. The colour varies, from tawny to bright yellow, and the whole plant partakes of the same hue. The pileus retains the remains of the veil, in the form of tufted dark scales, which are recurved, giving it a bristling appearance.

The affinity of *Agaricus squarrosus*, as far as configuration goes, is with the *Lepiotes* (*Ag. procerus*, &c.) but the colour of the spores removes it into a different subgenus, *Pholiota*, also scaly, but having rust-coloured dust instead of white. If this distinction is attended to it will prevent any confusion with *Ag. melleus* ("Les têtes de Meduse," Paulet) some states of which at first sight resemble the smoothest forms of *Ag. squarrosus*. The *Agaricus melleus* is a very common and in no way attractive kind; in spite of its honeyed name it is very deleterious, which the more formidable looking *Ag. squarrosus* is not, according to M. Paulet, who benevolently tried his "Tigre des Arbres," herissé as it was, upon himself, for the good of the rest of mankind, and happily survived the experiment. It seems superfluous to say that we do not recommend it to the fancier of Funguses.

The plate is a striking resemblance of *Agaricus squarrosus*, which, if it always had characters so marked, could never be confounded with any other species, it is however very variable. We have already cautioned the student how to distinguish it from the white spored *Lepiotes*, but there are some individuals of the genus *Hypholoma*, series *Pratella*, which, growing in a caespitose manner at the root of trees, (one of them, *Ag. fascicularis*, at the bottom of almost every post,) and being to boot yellow and bitter, it may be as well to discriminate from our Hydra friend *squarrosus*, the more so, as the term "Têtes de Souffre", or "Têtes de Meduse", or many other "Têtes" are mentioned in the French authorities we often quote.

In the subgenus *Pholiota* then, as in *Lepiota*, the veil is thrown over the head of the plant, and attached to the lower portion of the stem; it consists of a tenacious persistent membrane. In *Cortinaria* and *Hypholoma*, there is a veil also, but instead of being tenacious and persistent, it consists of arachnoid threads, a warp without a woof, a gossamer garment which is lost altogether by wear and tear, as the plant increases in bulk. Other funguses are veiled in slime, which renders them unpleasant to handle, but has the same preservative power, to shield the young plant, or rather its fructifying membrane, that the woven veils possess.

To return to *Pholiota*, if we put an umbrella into a case, which is fastened round the stick, we have no bad illustration of *Ag. squarrosus*, or any other of that genus, wrapped in its veil, which is attached to the stem. Suppose then that the umbrella were actuated by expansive growth in every direction, while the case remained on, the movement outward of the circle in which the whalebones are stitched would rupture this confining case, at the points where the pressure was greatest, and part would remain attached to the stick, by the cord which confined it originally, the rest forming shreds on the outside of the umbrella. Now the part attached to the stick, answers to the persistent ring of the Agaric, closely affixed to the stem before the expansion of the pileus. The shreds on the outside streaming from the apex of the umbrella, are the scales or the shaggy coat of the pileus, dense at top, where the force to divide and rupture was small, wide apart and ragged below, because the greatest dispersion is at the greatest circumference; also the upward growth of the pileus, carrying its case with it, ruptures it both ways, horizontally as well as vertically, and thus we have scales. These explanations apply only to those Cortinarious tribes which are destitute of the true veil, or enveloping membrane fastened under the root, which, when ruptured, leaves a volva.

Plate 1A.



Mitrula paludosa. Fries.

Reeve, imp.

PLATE IX.

MITRULA PALUDOSA, *Fries*.*Marsh Mitrula.*

Gen. Char. Receptacle ovate, inflated, closely surrounding with its base the distinct stem. Name from the receptacle resembling a *little mitre*.

Spec. Char. M. PALUDOSA; gregarious, cap variable in form, sometimes cloven, hollow, bright orange yellow; stem white; *asci* tubular; *sporidia* white.

MITRULA paludosa, *Fries, Berkeley*.

LEOTIA Ludwigi, *Persoon*.

——— uliginosa, *Greville*.

CLAVARIA phalloides, *Bulliard*.

——— epiphylla, *Dickson, Withering, Sowerby*.

Hab. On dead leaves in bogs or shallow stagnant water; autumn.

This pretty little plant, although the first we introduce to our friends of the second division, the Clavate tribe of Funguses, is not to be taken as an example of the club-shaped forms assumed by many members of that family, and from which their name is derived. *Mitrula paludosa* has a well-defined inflated head, placed upon a cylindrical stem, but the true character of *Clavaria* is to have no distinction between head and stem, merely a thickening upwards, equally differing from the *Pileati* on one hand, as from the *Mitrati* on the other. It is not to be expected that every character of a tribe can apply with precision to each branch of it, that certain botanical features should be common to all, is sufficient. One main distinction of the Clavate family is the situation of the hymenium, or that part of the plant which contains reproductive bodies, appearing in the form of dust. In the *Pileati* this property is placed under the pileus or cap, and is called inferior; in the *Clavati* it is superior; that is, lies externally upon the head,² and on placing any coral-formed specimens of *Clavaria* upon a plate of glass, their various ramifications will be prettily traced in the ejected spores. The bright yellow mitre of our present subject, becomes covered as it matures with a white bloom; this consists of sporidia packed in cases (*asei*), but the naked eye does not distinguish the fact.

That Nature abhors a vacuum was a principle of old philosophy which was certainly correct in so far

¹ From *clava*, a club.

² It is usual to speak of this head, the *clava*, as a pileus, which is a head-covering; extreme precision of terms may appear needlessly formal, but it assists the student, and if the term 'pileus' is the distinctive appellation of a tribe, it should be restricted to that tribe. The *Mitrati* have caps also; to call them 'pilei' leads to confusion of ideas. It would not do to talk of the 'mitre' of an Agaric; why, then, of the 'pileus' of a Morchella? With a *Clavaria* it is still less proper, since, although that Fungus possesses a head, it has neither cap nor bonnet to put upon it.

as she abhors idleness, for the moment the business of life is finished for one thing, even in its dying weakness, its place is taken by another, and this goes on till the succession of active energies has produced a residuum fit to nourish the giants of vegetation over again. But Nature does more than turn every thing to account, she adorns and beautifies while so doing; the dead leaf floating on the dirty pool becomes the seat of beauty, the golden Mitre with its pure glassy stem, embellishing those sombre hues, and reflecting brilliancy on the dull liquid below, while abstracting the substance needful for its own nutriment, by the fibres which decompose the defunct leaf into vegetable mould.

Our little plant is not common, it is found attached to dead leaves, in bogs or shallow stagnant water, or among deposits of decaying foliage, when thoroughly soaked with rain. The stems resemble undulating pipes of delicate glass, are very fragile, and sustained erect like masts by minute cottony fibres running among the leaves which form the raft; there are frequently many together, but no two of precisely similar configuration as regards the head, except that it is always hollow, forming a chamber at the extremity of the tubular stem; for the most part it contracts at the lower part, like the head-circle of a coronet, and tightly holds the inserted stem. There is, as Bulliard observes, a general resemblance, on a very minute scale, to the edible Morel, *Morchella esculenta*, which belongs to the third tribe designated *Mitrati*, from *Mitra*. "The Mitre, properly so called, had below a flat border, which surrounded it, and covered a part of the forehead, whence it was elevated in form of a cone and ended in a point."¹ This is the original from which our Bishop's Mitre has been modified, and is the model of the *Mitrati*; it will be allowed that our Fungus is fairly enough styled *Mitrula* or diminutive Mitre, but must not be confounded with the Classic headgear called *Mitrella*, which, Fosbroke says, was that very unclassical article a "mob-cap", the feminine form, with lower crown, and descending lappets capable of being united below the chin, of the Phrygian cap in which Paris looks so picturesque; our labourers still wear it, though with a very different grace, and the Welch *Mitrula* was donned by "Rebecca and her daughters," being the usual cap of their countrywomen.

The "bonnet rouge" carries us back involuntarily to that era of popular fury when it became so terrible an ensign; it seems to us that men could have had no time for Agarics, when revolutionary commotion surrounded them; the mind is so engrossed by prominent objects of horror, that we can scarcely imagine a back ground where innocent pursuits could be carried on, and peaceful occupations pursued; so however it was; the stormy tide raged round the opposing rocks, there was "distress and perplexity, the sea and the waves roaring," but those who kept themselves aloof in placid bays and recesses where the still waters rippled quietly, carried on as usual their unpolitical studies. "Le citoyen Paulet" collected funguses, and very seldom killed the dogs he crammed with them, he only made them rather uncomfortable for a few hours "étonnés" as he expresses it, with the effect of the strange food administered. We are in truth ourselves "étonnés" to read that in 1793, a book of this kind (*Traité des Champignons*) could be published at "l'Imprimerie Nationale exécutive du Louvre"; the next feeling is that the National executive is thereby redeemed from a portion of our disgust, *all* that they printed was not in blood.

¹ Fosbroke, Ency. of Antiquities.



Merulius tremellosus, Fries.

PLATE X.

MERULIUS TREMELLOSUS, *Fries*.

Gen. Char. Hymenium veiny or sinuoso-plicate; folds not distinct from the flesh of the pileus, forming unequal angular or flexuose pores. Named from *Merula*, a *blackbird*.¹

Spec. Char. M. TREMELLOSUS; resupinate, then free or reflexed, trembling-fleshed (*carnoso-tremellosus*), downy, white; margin dentato-radiate; folds porous, various, ruddy, spores yellowish white. "The form is deceptive, being pale in obscure places, but is immediately identified by its gelatinous cartilaginous substance. *Merulius spongiosus* differs from it in having the pileus shaggy and spongy, in other respects they exactly agree." (Fries.)

Hab. The foot of trees late in Autumn.

Although this Fungus appears to be common in Germany, it is not described by any of our English authors, unless by Mr. Berkeley recently,² nor is there any plant noticed by the French or Italian Mycologists with which it can be identified. Its affinity, at first sight, is with *Phlebia mesenterica*, but the curious basket-work of its reticulated hymenium distinguishes it from that plant, the *Phlebia* being smooth, or slightly wrinkled in drying. From the *Thelephoras*, and indeed from all the various sections formerly included under the generic name *Auricularia* (from their resemblance to the ears of animals), it is also distinguished by this membrane, which, in them, is even or papillate, smooth or corrugated, but never complicated into the elegant mesh-work peculiar to *Merulius tremellosus*. We have before introduced the genus *Merulius* in the individual *M. lachrymans*, with which the casual observer may suppose the present species has little connection; yet the sheet of pores from which the plant extends itself upwards into fronds, is very like the resupinate cellular state of *M. lachrymans*, which also, in favourable situations will form a globular irregular mass, approaching to a pileate Fungus in its more commonly received acceptation; though, be it remembered, a pileus is not less a pileus, because it lies on the ground (sessile), or topsy-turvy (resupinate) instead of being elevated on a post (or stem).

On first approaching *Merulius tremellosus*, it appears not unlike a buff specimen of *Polyporus intybaceus*, being a complicated mass, similarly situated at the foot of a tree, and quite as much like a domestic fowl as "La poule qui couve" is to the Grouse. It also in general growth resembles *Dædalia biennis*, which has a delicately labyrinthed hymenium, but the *Dædalia* is corky not gelatinous; we have before remarked the difference between *Phlebia mesenterica* and our *Merulius*, and by the aid of its portrait, and a precise verbal description, the student will avoid mistake; it is always satisfactory to determine a species, otherwise no danger can, in this case, arise from error, as none of the plants in question are deleterious, and none recommended for food. This *Merulius* then, forms a patch of reticulated pores, entirely resupinate upon the

¹ Because some of the tribe are black! But some are yellow; so whether the *bill* or the *body* of the bird suggested this fanciful name, may be decided by those who deem themselves competent.

² In that part of Lindley's 'Vegetable Kingdom' devoted to the subject of Mycology, but, being out of print, I have not seen it.

roots of grass; it soon extends up every stem and blade, in appearance like a branching madrepore, and encloses every object, grass, straw, or twig, in its stifling embrace; as soon as it becomes free from the encumbrance of the grass, which is about two inches from the foundation, it begins to form pileate fronds, which are connected together and confluent in a rosette style. Each pileus is ridged, owing to the plaited rows of pores beneath; the disposition of these reticulations, course above course, is very elegant, they do not extend so far as the margin, which consequently incurves and collapses for want of support. The margins are tinged with bright rose colour and more or less denticulated (or toothed); the hymenium is flesh-coloured-buff, mixed with shades of rose, and when the white spores are developed, has a shot-silk effect. The upper surface is tomentose, drab-coloured or buff when moist, and growing white in drying. The smell when old is very strong and disagreeable.

The specimen from which the drawing is taken was found among the ancient oaks, which sustain and shelter an innumerable family of dependants of this kind, at the foot of Hayes Common, going towards Wickham. *Fistulina hepatica* juts out in scarlet glory from their limbs; the soil at their roots is loosened by thousands of little congregated brown heads belonging to the excellent *Agaricus fusipes*; pink, grey, and buff members of the milky tribes show themselves to the highest advantage on the luxuriant carpet of green moss; there, are as many Verdettes as the most unreasonable epicure could desire, and *Boletus edulis*, large enough to sustain the feast; there did we once discover an ambitious toad, who, having forsaken his legitimate stool beneath, was perched half-way up a tree, upon a carrion-looking *Fistulina*, which perhaps had tempted him thither, but how he got up he never vouchsafed to tell; in short, from the warm spring showers to the chilly autumn dews, under those picturesque old ruins of the forest, which might have seen Cæsar if ever Cæsar had been there, the Mycologist will find a harvest of some kind; and greatly do the boys who hunt up the pigs straying for acorns, and the boy who raises his sleepy head from the sheep-dog's back, wonder why, day after day, Bond-street coats and muslin gowns invade their out-of-the-world solitudes. Those noble old trees! no traveller passes them without respectful admiration, and the spot is sacred to better things than Agarics; the roots of the venerable English Oak go down into the tumulus of some British chieftain, who looked, in the pride of freedom from his strong position, over those pleasant expanses of Kent and Surrey, which perhaps he fell in defending against the invading Rhemi.¹ His memory has perished; but the name of a greater man, the defender of liberty by that weapon of eloquence which shall one day supersede the sword, consecrates a younger tree on the brow of the hill. Under it, sat and mused Lord Chatham! seeking repose of body and peace of mind after the turmoil of the stormy senate, and the petty, factious opposition which chafed his patriotic soul, and killed him at last. He did not die in "The House", as many who look on Copley's noble picture suppose; they brought him down to his own quiet Hayes, and there his spirit passed away.

¹ Keston is known as a Roman station, and called Cæsar's Camp, but was first a British strong-hold, of which the fortifications remain in Holwood, or, according to a more ancient spelling, Holy-wood (the modern park of Mr. J. Ward, formerly the favourite home of Lord Chatham's famous son, William Pitt), this is said to have been the head quarters inland of the Remi, or Rhemi, who shortly preceded the Romans, and were in league with them. The last out-post to the east is Farn-borough or burg, and to the west extends an elevated table-land, frequently scarped, called the War-bank, the terminating point of which is known as *War-end*, vulgarized into *Warren*, hill; this is the site alluded to above, and it is crowned by Lord Chatham's favourite tree; while half way down is the Tumulus, on which two oaks of a thousand years are still flourishing.



Tubercularium, Sibth.

AMH. del

Ferve imp

PLATE XI.

TUBER CIBARIUM, *Sibthorp*.*The Common Truffle.*

FAMILY TUBERACEÆ.

Gen. Char. Sporangia membranaceous scattered on the serpentine vein-like hymenium, included in the concrete uterus.

Spec. Char. T. CIBARIUM; uterus closed, marbled with veins internally; sporangia pedicellate, confined to the veins. "Rough irregular rounded nodules, from one to two inches in diameter", black or dark brown, covered with obtuse polygonal warts, rootless ("at first covered with the thin fibres of the *mycelium*", Corda) then naked except a little brown down (probably the remains of the *mycelium*); inner substance fleshy, pallid, veins at first white, darkening with age, tortuous; sporidia echinulate.

TUBER cibarium, *Sibthorp, Fries, Berk., With., Sow., Bull., Persoon.*

Hab. Downs and forest-land, in parks, under various trees in rich alluvial soil; buried from two to eight inches deep.

Evelyn in his diary for 1644, notes—"We got to Vienne in Dauphine * * * here we supped and lay, having amongst other dainties, a dish of Truffles, an earth-nut found out by a hog train'd to it, and for which those animals are sold at a great price". Now, as Evelyn was a gentleman brought up in the best society, Truffles had not become an English luxury, at the date he mentions their appearance at table as a novelty to him; it by no means follows, however, that there were then no Truffles in England, but simply that they had not been commonly found³; at the present time they would be discovered in many unsuspected localities if sought for. It has been asserted by several authorities that the Truffle is not an indigenous production, but that it came to Rushton in Northamptonshire, in the earth attached to the roots of trees, brought over from Languedoc; Truffles certainly abound at Blenheim, at Avington, at Audley End, and in the parks of many of our ancient mansions, which were early embellished with transplanted ornaments from France and Italy, and this gives some plausibility to the opinion; on the other hand, they are found where no trees but such as are truly indigenous, come within the limits possible for their propagation.

About the period, however, when Dr. Tancred Robinson first noticed the *Tuber cibarium*, 1693⁴, it became an imperative fashion for English gentlemen to make the "grand tour", and thus they doubtless acquired a taste for ragouts, which, not even a transplanted French cook could manufacture without their

¹ From *γαστήρ*, the *stomach*, and *μύκης*, a *fungus*.—Hymenium included.

² From *ἀγγεῖον*, a *receptacle*, and *γαστήρ*, the *stomach*.—Uterus distinct from the included proper receptacle.

³ The "*Tubera minima, nucis magnitudine, coloris purpurei*" of Ray, seem to have been the *Tuber cibarium* in a young state; he does not mention them when mature.

⁴ Phil. Trans. No. 202. p. 824.

chief ingredient, the famous "Truffles d'hiver"; enquiries would be instituted for the delicacy they had now learned to appreciate, and those "earthie excrescencies"¹ which to English naturalists had appeared a disease, "callosities or warts bred in the earth"², and to English sense, "of a rank odour and unsavoury", under foreign influence, were rescued from the pigs, who for anything we know to the contrary, might have been seeking them on their own account ever since the days when that careful domesday estimate of English property was made, in which "pannage for hogs" forms no inconsiderable item.³

The addiction of swine to this delicate food being turned to account by man for his own benefit, Herr Krombholz gives amusing directions how to carry on the search; "You must have a sow of five months old, a good walker! with her mouth shut up by a leathern strap; recompense her for the Truffles with acorns; but as they (pigs) are not easily led, are stubborn and go astray and dig after a thousand other things, there is but little to be done with them * * * dogs are better, of them, select a small poodle."

Fosbroke says, "About forty years ago William Leach came from the West Indies with some dogs accustomed to hunt for Truffles, and proceeding along the coast from the Land's End in Cornwall to the mouth of the river Thames, determined to fix on that spot where he found them most abundant. He took four years to try the experiment, and at length settled at Patching (near Arundel co. Sussex) where he carried on the business of Truffle hunter till his death".

The nature of the soil Leach thus selected for the field of his labours, is precisely that which the continental authorities point out as most favourable to the growth of the Truffle; a rich mixed alluvium. "It prefers clay mingled with sand and ferruginous particles, and requires the earth to be rather porous, that heat and moisture may easily penetrate" (Persoon). It is commonly supposed in England that the Truffle is produced exclusively under beech trees, and this erroneous opinion prevents its being sought elsewhere, although its habitat is quite as often beneath other trees. "Its darling abodes are hilly, shadowy yet light, and lofty woods of chesnut, oak, and beech; never in pine forests; among soil formed of decayed vegetation, in dyke-carth mixed with sand, in open woodland districts where rain and worms act⁴ easily; damp warm summers are most favourable". It must be remembered that when foreign authorities cite "woods" as the habitat of funguses, they do not mean the close impervious copses, matted with coarse grass, briars, &c., and rank with decaying vegetation, English underwoods, sacred to Pheasants; but those forest-glades which the deer may haunt, without fear of entangling their antlers, irregularly canopied by trees of lofty bole, "*de la haute futaie*"; such spots as the lover of the picturesque finds in our New Forest, and the "melancholy Jacques" reposed in, in the fungus-rich Ardennes. It is quite possible to detect the presence of Truffles by carefully observing such places as are suitable for their growth, the earth being slightly upheaved and cracked above the "nests"; when this is the case, their peculiar smell is very perceptible; indeed, I am informed that in Hampshire, sport is often spoiled by the dogs losing scent of Reynard as they near these strongly odorous spots; perhaps he cunningly takes across them; be this as it may, "the field" on these occasions does not use strict mycological terms to characterise the Truffles.

Probably twelvemonths are required for the entire developement of the *T. cibarium*. In the early spring it is but a tubercle as large as a pea, reddish or violet colour; it increases in size but retains the purple hue till June; the flesh during this period is quite white; in this state it is, according to Paulet, the "*Tubera minima nucis magnitudine, coloris purpurei*" of Ray; in July it becomes externally grained and rough, the

¹ Gerarde.

² Such opinions were borrowed from Pliny, and the ancient naturalists who considered them a disease, "tumor terræ" or "swelling of the earth". Pliny, however, divides *tubers* into two classes, the white and the black, and describes both as articles for the table.

³ A German critic suggests that perhaps the "Pig-nuts" which Caliban thought so great a delicacy, were Truffles, which Evelyn and Fosbroke both style "earth-nuts" and not the common Bunium, the earth-nut of our pastures. This is quite a novel "nut" for the commentators, and ought to be appreciated.

⁴ Krombholz.

inner substance scarcely marked by the veins; at which period the French bring them to market as “Truffles d’été”; being however very insipid and indigestible, it is a pity to take them up at that season. They are excellent for the table from October to January; black, and covered with bark or rind which is composed of irregular, angular prominences. On cutting them across the substance resembles a waxy potatoe, but a maze of white veins intersects it; at a later season the flesh grows dusky, and the veins, from the ripening of the sporidia, dark; soon after this the whole substance of the tuber “melts into a kind of pap” (Paulet), and thus doubtless affords nutriment to the germinating plant till it is able to digest commoner aliment. But all this is performed underground, and Nature keeps back many secrets from the most earnest of mortal inquirers.

The Truffles lie from two to eight inches deep, they vary in size according to the number that possess the parent nest, which is from two or three to a dozen; when there are as many as this their shape is rendered extremely irregular by reciprocal pressure. Truffles, “as large as a man’s head and weighing one pound and a half,” (Krombholz) are unknown in England, the average size being from that of a nutmeg to a hen’s egg.

It is a lucrative business in some districts, for the season begins at “bird-shooting” and lasts till spring, the produce selling at half-a-crown the pound; it is therefore a cherished trade-secret, and those who follow it generally seek to mislead the enquiring botanist, believing him to be a rival, and likely to rob them of their profits. It is said that in Italy and the south of France it may be known where these favourites lie, by the growth of *Cistus tuberaria*, Linn. It is not an English plant, however, having been introduced by Miller in 1748.

Of medical properties the *Tuber cibarium* is probably innocent; the *Tuber cervinum*, Elaphomyces of Nees (Fries), which Matthioli distinguishes as *Fungus cervinus*, is the plant the old physicians seem to have had in view in their pharmacies and is the *Lycoperdon cervinum* of Linnæus, but the *Scleroderma* too has been called *L. cervinum*, and in some synonymes is confounded with the Truffle. The *Lycoperdon Tuber* of Linnæus, generally quoted as *Tuber cibarium*, is *Elaphomyces muricatus*. This is rare in England, so is the *Rhizopogon*, or white Truffle. There is no other Fungus that can be confounded with the true black Truffle, *Tartufo nero*, of Italy; if the commonest observation is employed, one rule is certain and simple, nothing is a Truffle that grows in part above ground.

According to the best authorities, Truffles are very wholesome and nutritious. The highest flavour lies in the skin, so that it is wrong to pare them, they should be merely well brushed in water. The aroma is almost entirely lost in drying, they cannot therefore be eaten too fresh, and if sent to a distance should be closely packed in damp sand. Much disappointment is often expressed that so costly and renowned an article should be so insipid; it is not owing to any difference of national perception in matters of taste, so much as to the fact that in England Truffles are comparatively worthless, from being purchased and used in a dried state.

They may be stewed in champagne, with a little oil or butter and pepper and salt; being thinly sliced, they will require half an hour to become sufficiently cooked. A friend, native of that locality, informs me that simply boiled, the only condiment used being salt, the *Tuber cibarium*, or Black Truffle, is eaten as a relish with wine at Tanjier, and the neighbourhood; they abound also at Gibraltar, where they may be purchased at a most reasonable rate, and being carefully packed in earth have often been transmitted to London friends, in excellent condition. This hint may serve to direct English mercantile enterprise into a new channel, and we do not despair of the Numidian Truffle also, which the Romans trafficked in as a most valuable luxury, being introduced at the tables of our modern epicures, the voyage being quick and certain.

If the earth beneath trees is slightly heaved up and cracked, in the situations and soils which have been mentioned as favourable to the growth of Truffles, it is well worth the trouble of a search to ascertain whether they are present or not. A strong long-toothed iron rake penetrates deeply enough to extricate them under such circumstances; for this hint I am indebted to Mr. Berkeley, and it may be satisfactory to know that the same great authority prefers them roasted in the embers.

Truffes à la Maréchale.—Paulet.

Having thoroughly washed them with a brush, put to each a pinch of salt, and the same of black pepper, wrapping them separately in several folds of greased paper, put them into an iron pot or pipkin and cover them with red-hot embers, taking care to envelope them thoroughly by shaking; let them stand an hour, and serve, retaining the inner paper-case.

As this mode preserves the skin it appears far better than the simple roasting in embers, which is the usual amateur's mode of cooking the fresh Truffle; and most certainly those who only know the Fungus as an appendage to full-dress calves' heads, will acknowledge they were in perfect ignorance of its true merits when they taste it in either of the ways now recommended.



Agaricus violaceus, Linn.

J. R. & A. M. H. del.
E. M. del. lith.

Boett. del.

PLATE XII.

AGARICUS VIOLACEUS, *Linn.*

Gen. Char. Hymenium consisting of plates, radiating from a common centre, with shorter ones in the interstices, composed of a double closely-connected membrane, more or less distinct from the pileus. Veil various or absent.

Series CORTINARIA.¹Sub-genus INOLOMA.²

Sub-gen. Char. INOLOMA; veil fugacious, marginal, consisting of free, arachnoid threads. Stem solid, bulbous fibrillose, more or less diffused into the pileus, fleshy. Pileus fleshy, curved when young, then expanded, fibrillose, or viscid, regular. Substance juicy. Gills emarginato-adnexed, broad, changing colour. Colour of the pileus or gills violet. Large autumnal Fungi, growing on the ground.

Spec. Char. AG. VIOLACEUS; pileus from three to six inches broad, obtuse, then expanded, villosa-squamose, obscure violet; gills, when young deep violet, nearly black, changing to reddish ochre, distant; stem four to six inches high, spongy within, then hollow, cinereous tinged with black, and stained by the ochraceous spores above the point of attachment of the fugacious veil, when young tomentose, the base bulbous, and covered with white fibrous down when growing among decaying leaves.

AGARICUS violaceus, *Linnaeus, Withering, Fries, Berkeley, Roques.*

———— araneosus, *Bulliard*

Hab. Pine groves; among dead leaves and rubbish in a shrubbery and near very decayed compost, not on recent dunghills. Autumn.

“Le violet Evêque” of Paulet, is a strikingly handsome Agaric, not likely to escape notice and attention, it is, however, rare. The noble plant from which the accompanying drawing was made, grew in Miss Traill’s park at Hayes, among sweepings and leaves laid up to decay; it has never re-appeared on the same site. In a young state the pileus is damp (it does not amount to viscosity) and incurved; a veil of fragile threads, called arachnoid because resembling those of a spider, extends to the margin of the pileus, and is affixed to the stem, forming a delicate screen over the gills till the plant is nearly mature; at which time it is totally ruptured and dispersed by the expansion of the pileus, except the extremities, which contract upon the stem into a slightly persistent ring, above and upon which the spores are shed; below, the stem is fibrillose, so that even in old age the place of the veil’s attachment may be traced. It is necessary to observe this, because it identifies the Agaric as one of the Cortinarius tribe; Withering says the fragments of the veil sometimes remain attached to the edge of the cap also; that the colour of the pileus varies much with age, losing its lilac and gaining a russet hue. Our Agarics, in their perfection, were intrinsically dark violet, approaching to black, with a copper gloss over it, an effect very peculiar and

¹ From *cortina*, a *veil*; spores reddish-ochre; veil arachnoid.

² From *ivès*, a *fibre*, and *λωμα*, a *fringe*.

difficult to render. They did not readily decay; had the odour and taste, raw, of the common Mushroom and became of a particularly rich high flavour, cooked. They cannot be called lilac at any age or stage, the "violet évêque" is a much better term, that of the darkest hedge violet, which we too, call 'Bishop's purple.' This is the colour of the gills before the spores attain maturity, they are in great quantity, and therefore the gills "emit a plentiful powder," as Bulliard and Mr. Stackhouse agree; but the latter gentleman does not correctly discriminate the hue in likening it to "Spanish snuff," it has a redder and more ochraceous tinge. Paulet, who describes this Agaric very faithfully, failed in identifying it with any of those mentioned by his predecessors in that path of study. The *Violaceus* of Sowerby is our Blewitt, a very different species, with pallid brown-buff pileus, slightly tinged with lilac, and gills more or less the same, but, as it sheds a copious white dust instead of ochry, no further difference need be pointed out; the placing the pileus, gills downward, on a piece of glass, or smooth black substance, by procuring a deposit of spores, will give perfect certainty as to whether, on examining any violet or purple Agaric, it is to be placed under *Leucosporus* or *Cortinaria*.

On cutting *Agaricus violaceus* across, it will be found that the flesh, although predominantly white, has a tinge of the external violet, and beneath the epidermis that of the pileus is deeply stained with it. No Agaric displays better the distinct nature of the membrane the gills are composed of than this, the flesh of the pileus running down between these folds called gills, in a very striking manner, and proving that "they are not formed, as some have supposed, of layers of the reduplicated seed membrane alone, but by a prolongation of the fibres of the pileus, which these merely invest." (Badham.) The gills are styled, in the series *Inoloma*, "emarginato-adnexed"; that is, hollowed out behind (emarginate), and placed close (adnexed) to the stem, not united with it. The white downy substance investing the bulbous part, must not be considered as the root of the plant, its use seems to be to attach the tall heavy Fungus to dead leaves, the earth, and even to small stones, by which means it is secured in an upright position.



Morchella esculenta, *Dictyo.*

PLATE XIII.

MORCHELLA ESCULENTA, *Dillenius*.

Gen. Char. Receptacle campanulate and free, or conico-globose and adnate. Hymenium costato-reticulate, celluloso-lacunose. Asci tubular, containing white or yellowish simple spores. Name, from the German '*morchel*.'

Spec. Char. M. ESCULENTA; receptacle ovate or globose, adnate at the base; ribs firm, irregular, anastomosing at various angles, forming deep wrinkled cells; stem cylindrical, short, granulated, white or flesh-coloured; spores white.

MORCHELLA esculenta, *Fries, Persoon, Tratt., Berkeley, Greville, Roques, Vittadini.*

PHALLUS esculentus, *Linnaeus, Bolt., Withering.*

HELVELLA esculenta, *Sowerby, Purton.*

Hab. In dry woods and gardens throughout Europe; under elms, near hedges, particularly where charcoal has been made. Spring.

The Morel was formerly much used and esteemed in England, but of late years has declined in public favour; it is, however, an excellent article of food, and in a fresh state may be ranked with the most delicate of the Fungus tribe. In this country the Morel is far from common, in fact, so little known, that it has been mistaken for the Truffle! probably because they are often mentioned together in old cookery books, for they do not at all resemble each other in external appearance or flavour.

Krombholz says that he procured most of the Morels, which he has described in great variety of form and colour, from gardens and pine woods, among the fallen leaves and moss. The Scotch Fir, *Pinus sylvestris*, is a great patron of Funguses in general, and under its guardian shade we found Morels in Kent, in May, 1847. Very splendid specimens appeared simultaneously in the gardens at Wickham Court, and at Hartwell near Aylesbury, ten days after warm thunder-rains. A favourite site for them is between the grass-plot and gravel walks; at this point of junction they frequently emerge, the soil being there less tenacious, and perhaps the fine sand washed from the gravel favours their growth; which will reconcile the statements of two differing authorities, one of whom cites 'clay,' the other 'sand,' as their chosen habitat; a loose upper surface and heavy sub-soil will explain this contradiction. It is very certain that by slightly burning the surface of stumps of the Cob-nut tree, the Italians produce a delicate Fungus (*Polyporus corylinus*),² and in the March of Brandenburg "the industry of many women has gone so far as to set fire to the woods, in order to get a rich and valuable harvest of Morels".³ Why a process so fatal to vegetable life in general should produce this result, may be accounted for on the supposition that the wood, undergoing a process to a certain degree destructive to its own vitality, is thereby rendered a quiescent nourisher of the parasite. There is, however, another cause for the Morel flourishing where woods have been burned, more plausible than any good effect of the charcoal itself; we have remarked that it forces its hollow globular head most readily through the edges of turf and walks, where it meets comparatively little resistance, and it is evident that the tangled roots of grass and sylvan plants, must grievously impede the upward growth of a soft mass three or four inches in diameter; the action of fire, by leaving the ground bare of vegetation, may therefore assist the developement of the Morel which is lying below the surface, the charred wood having no direct influence in the matter. It is probably owing to this compression among roots and obstructions of different kinds that the common Morel assumes forms so various and irregular; it often appears lobed,

¹ From *mitra*, a cap or bonnet. Receptacle bullate or campanulate, placed on a stem. Hymenium superior.

² Vide Badham's 'Esculent Funguses of England', Frontispiece.

³ Krombholz.

twisted in the stem, and contorted into monstrous shapes; and the size varies extremely; so that the inexperienced collector may be greatly puzzled by anomalous forms, which are not truly a different species; "Some are more agreeable than others, but none are hurtful," is therefore a comfortable assurance of Corda's. The mitre of the esculent Morel is never open at the top, unless accidentally cracked; it is never free from the stem at the bottom, but gathered in and fixed closely to it. These distinctions mark it at once from the *Phallus* tribe,¹ which have an orifice at top, and from its own congeners which are free from the stem at the bottom.

According to Vittadini, the Morel, in the earliest stage it is met with, is a little whitish tubercle, emerging from an earthy base, clothed with cottony web. The head is smooth at first, showing on the surface small spots and lines corresponding to the future cells, which are then closed by the projecting portions of the ribs; the stem is early formed and remains for a time solid, becoming afterwards hollow or slightly stuffed. The entire case of the stem is of a double texture, curiously plaited and gathered in at the root; the external coat terminates by bending outwards to connect itself with the margin of the cap; the internal one, having first doubled back upon the outer, so as to form a supporting shoulder, passes upwards and makes the skeleton of this honey-combed cap, the cells of which are lined by the coloured hymenium, between which, in age, the white substance of the ribs is very apparent at their angular junctions. The sporidia are packed one above another in tubular asci, and fly off in jets of dust which falls again around the plant; this seminal dust is white or yellowish. The stem and cap form one continuous cavity without division of any kind, which is generally granulated in texture, and unequal in surface from the depression of the deeper cells into it.

Differences of soil, climate, age, and colour, cause the *Morchella esculenta* to appear under so many different aspects, that it is not surprising a number of species have been described, although strict investigation will reduce them to mere varieties; of these varieties the two selected are, a small specimen of *M. esculenta* very near *M. rotunda* of Persoon, and *M. esculenta*, var. *fulva*, of Fries. These were found at no great distance from each other, the latter under the shade of shrubs and Scotch Firs, solitary; there was no grass nor weed near, the earth had not been moved for some years, and was covered with minute green Algæ and dead leaves of the Fir. It was extremely persistent, reviving on the application of water after partial drying, had neither flavour nor scent raw, but was excellent when cooked. It will be seen that the description of Krombholz exactly applies:—

"The hat is oval, fox-brown or brown-yellow, the ribs are roundish, but at their places of conjunction, flat and channelled. The cells are large, irregular, rather long, seldom lozenge-formed, deeply hollowed out, folded and full of veins; the whole hat looks swollen, and its base is from two to three times as broad as the stem, so that the hymenium bends inwards underneath in order to reach the enlarging stem. The stem is two or three inches high, rather higher than the hat, widest below, narrowed near the top, above which narrow place it becomes larger, extending itself in a horizontal direction to meet the edge of the hat; it is smooth, white, and tender. The hollow of the hat is large, wide, smooth, except in some unevennesses caused by those cells which lie deepest; it joins the cavity of the stem without interruption. The substance, both of the hat and stem, is white, tender, from one to two lines thick, becoming considerably thickened at the base."

Morels should be gathered in dry weather, after rain or dew they have not so much flavour. Reject the stems, cut them in equal-sized pieces, well wash and stew them with a glass of hock, as directed for the *Cantharellus*. Or they may be stuffed with bread crumbs, meat, chicken, shell-fish, &c., finely minced and seasoned, then wrapped in slices of bacon and roasted, serving them in Italian sauce, or any piquant brown gravy with a little light wine in it, and buttered toast may be placed beneath them.

¹ It would have scarcely been needful to have mentioned this, as no one, it is to be supposed, could contemplate eating a *Phallus impudicus*; but a friend, who had been much in Italy, gravely asserting that he had seen great quantities of it purchased in the markets of Sicily, proved the olfactories are not always to be relied on,—he mistook the offender for a free-bordered Morel.



Lycoperdon saccatum, Fries.

PLATE XIV.

LYCOPERDON SACCATUM, *Fries.*

Gen. Char. LYCOPERDON. Peridium membranaceous, with an adnate sub-persistent bark, within furnished at the base with a spongy sterile stratum. Capillitium unequal.

Spec. Char. LYCOPERDON SACCATUM. Peridium pulvinate, lentiform, obtuse, depressed, constricted at the base. Stem thick, subequal, both the peridium and stem covered with a very thin adnate spinulose bark, that of the peridium bursting into areolas. Capillitium compact, contiguous; spores dusky-fuliginous, placed on very short pedicels.

Hab. In marshy ground composed of sandy peat, under Scotch Pines. At Keston, Kent, 1840 and 1842.

This very singular *Lycoperdon* was found for the first time in England at the date given above. In the Autumn of that year it was abundant in one favoured spot, in company with *Boletus laricinus* and *B. annulatus* (of Persoon), a favoured spot so far as that mycological treasures were displayed there in variety and profusion, but nothing else, the scanty grass was too rank and sour to tempt the cattle, and probably no foot but that of the inveterate Fungus-hunter invaded the pet nook, lying as it did, with the gloomy shadow of Scotch Firs to the south, exposed to the bitter North-east, and up to the ancles, when filled with rain, like a sponge. Improvement came; an amateur Liebig pared, and burned, and ploughed, and sowed (we do not know if he ever reaped), the desolation of his agricultural mania had blighted *our* harvest, and the finest crop of corn would have been worse than thorns and thistles in our eyes.

The *Lycoperdon saccatum* is a moderate sized Puff-ball placed upon a tall swollen stem. In youth the entire plant appears to consist internally of a homogeneous soft white substance, and the division between the barren stratum forming the top of the stem, and the receptacle of the spores, is not visible; in a very short time, however, the flesh of the stem becomes yellow, the spores grow dark olive, and the whole interior of the head flows out, bursting it irregularly, in the form of a most offensive deep greenish liquid, which carries off not only the spores, but the whole peridium or puff-head in one general decay, after which the stem, not being hollow, but elastic and spongy, remains long entire, with the barren stratum surmounting it. So remarkable a Fungus can scarcely be mistaken, indeed no member of the *Lycoperdon* family at all resembles it, except a variety of *L. gemmatum*, the *Lycoperdon Proteus* of Sowerby, which has an elongated stem; it is, however, much smaller in all its proportions, and the head is covered with spinulose warts, neither does it send forth its spores in a liquid as *L. saccatum* does, but they are discharged from a prominent

¹ From γαστήρ, the *stomach*, and μύκης, a *fungus*; hymenium included in the receptacle.

² From θρίξ, a *hair*, and γαστήρ, the *stomach*; receptacle filled with floccose hairs on which the spores are placed.

mouth in jets of dust, the head remaining entire when dry as what is called "a Devil's snuff-box". It is probable, judging by analogy, that when in a youthful white-fleshed state *Lycoperdon saccatum* is edible; yet it is so rare in England that the fact is of little importance. It should, however, be generally known that *Lycoperdon giganteum*, (the *L. Bovista* of Linnæus and of Dr. Badham's "Esculent Funguses of England") that immense white ball, as large and larger than a man's head, which is so often knocked about in sport in our pastures, is not only quite safe to eat, but most excellent. The summer of 1846 was extremely favourable to the developement of these giants. One in particular was brought in, extremely irregular from having been impeded and squeezed among some trunks of felled timber in its first growth, the mass of which equalled in bulk two quartern loaves, and the following is the report of an amateur of Funguses, and very good judge of "recherchés" viands in general, "the puff-ball made such an excellent omelette and is so much better than any mushroom I ever before tasted, that it ought not to be called mushroom".

After such testimony from persons who have had full experience of their qualities, the innocent and agreeable Puff-balls should be no longer left to decay in obscurity, or be destroyed in childish wantonness. Everybody knows them, and as mistake and injurious consequences are impossible, for no other Fungus can be confounded with them, we hope our readers will place faith in our assurance and try this receipt for

Omelette of Giant Puff-ball.

They are in a proper state for cooking, when, on cutting across, the interior is of an uniform pure white, if yellow stains appear, they are too old. Slice them half an inch thick, have ready chopped herbs, pepper, salt, &c., as for an ordinary omelette of eggs, dip the slices of puff into yolk of egg and sprinkle the herbs and condiments upon them, fry in fresh sweet butter and let them be eaten immediately. They are much lighter and more digestible than egg omelettes, and resemble brain fritters.



Agaricus rufus, Scopoli



PLATE XV.

AGARICUS RUFUS, *Scop.**Rufous Milky Agaric.*Series LEUCOSPORUS.³Sub-genus GALORRHEUS.⁴

Gen. Char. GALORRHEUS. Veil none. Stem naked, firm, subequal, diffused into the pileus. Pileus fleshy, firm, plano-depressed, umbilicate, margin even, when young involute. Gills unequal, often forked, narrow, attenuated behind, adnato-decurrent. The whole plant abounding in a milky juice. Spores white (buff in *A. fuliginosus*). Large or middle-sized, persistent, frequently acrid fungi, growing on the ground.

Spec. Char. A. RUFUS. Pileus from two to four inches broad, at first more or less umbonate, with a depression round the umbo, the margin waved, slightly turned in, afterwards expanded and plano-depressed or infundibuliform. Dry, adpresso-tomentose, zoneless, dull, uniform bay-red, fleshy, firm; milk white, intensely acrid, not changing. Gills at first pale, then salmon-buff, decurrent, narrow, here and there forked. Stem from two to three inches high, half an inch thick, nearly equal, but contracted at the base so as to be seldom quite perpendicular, extremely firm and elastic, rufescent, stuffed, in age partly hollow, the base downy. In the pine woods of Germany, one of the commonest Agarics. Fries considers *A. helvus* the same plant, affected by a different soil, and gives the following characteristics. "Pileus fleshy, soft to the touch, plano-depressed, dry, silky-squamulose, zoneless, pallid brick-red; stem stuffed, then hollow, pubescent; gills fine, thick together, ochry white, milk scanty, white, acrid; the pileus often cracking, pale and coarse, and the milk watery when growing in marshy places."

AGARICUS rufus, *Scopoli, Fries, Berkeley.*

———— ruber, *Persoon.*

———— helvus, *Fries.*

Hab. In sandy peat under Scotch Pines. Keston, Kent; late autumn. In Hampshire in a similar site.

"The section *Lactarius* of Fries, *Lactifluus* of Persoon, is perhaps the most naturally formed class of Agarics; all that are included in it, beside the milky fluid they contain, possess similar characteristics and an almost uniform habit; yet this uniformity of appearance, makes the determination of species extremely difficult, which, considering their different peculiarities, renders these Funguses not exempt from danger; to this may be added the differences of opinion prevailing even among mycologists, with regard to the properties of those individuals, which are commonly esteemed among the most innocent". This opinion of Vittadini, does not encourage us in forming the acquaintance of the class *Lactarius*; but difficulty is a stimulus to some dispositions, and at any rate if it frighten the student, should induce the teacher to take greater pains.

There is little fear of English folk committing any rashness in respect to Funguses as an article of food, but it will assist discrimination if the decidedly dangerous are known as well as the decidedly safe; besides,

¹ From ὑμῆν, a *membrane*, and μύκης, a *fungus*.

² From *pileus*, a *cap*.

³ From λευκός, *white*, and σπόρος, a *seed*.

⁴ From γάλα, *milk*, and ῥέω, to *flow*.

is it not the duty of a moralist to point out examples to deter, as well as models to imitate; and of a mycologist to warn against involuntary emetics, as well as to recommend dainty stews?

The *Galorrheus* family are remarkable from containing in the interior of their substance, a milky liquid which flows in drops as soon as they are broken or punctured; this milk varies in colour and quality; in some cases it changes its hue on exposure to the air, thereby staining the Fungus in blotches, where it has been bruised; in very dry weather milk may not exude, and in very wet, it may become attenuated and watery, but there is only one of the class which is always entirely destitute of it, *A. exsuccus*, and one, *A. Cilicioides* in which it forms a "superficial moisture," according to Dr. Greville. From their generally assuming a cup or funnel shape, by which the pileus acquires the capability of retaining rain, the French give them the title of "water drinkers" "eau-boiront" and "Poivrés" on account of the pungency the milk possesses in many cases; this pungency however has none of the aromatic agreeableness of pepper; it is at first scarce perceptible, but presently burns in the mouth like Mezereon berries, or *Euphorbium*, and in the acrid *Rufus* and its dangerous relatives, becomes insupportably violent; this *A. rufus*, our present subject, there is only one opinion about, that it is utterly unfit for the table, and when accidentally taken to the extent of a couple of ounces produced very alarming effects, although timely remedies prevented their proving fatal. Of the most commonly eaten, *A. piperatus*, which is largely consumed in Germany, Russia, and some parts of France, M. Paulet says it has never been charged with homicide, (a virtue in a tribe condemned by such designations as, *Necator*, *Torminosus*, *Meurtrier*) but he adds with charming naïveté "j'avoue que ce n'est point un met délicat, il est même un peu amer, et lourd sur l'estomac." One milky Agaric, *A. deliciosus*, most "venemous" in appearance according to vulgar notions, for it is of a yellow hue, with red milk which changes to green, is perhaps the best of all the edible kinds and may be safely ventured on, for the very reason that its peculiar green stains where injured, distinguish it from all others, it will be hereafter described at length, and is the only one of the family we recommend as food.

Is there no use for this profusion of deadly Toadstools? are thousands of beautiful objects strewn about our paths and disposed in elegant fairy rings under the trees where we are lounging, only to bite our tongues if we venture to taste them? That Nature does nothing in vain is an axiom further research always proves we should trust, although at first the utility of her productions may appear a mystery to our ignorance. The natural food-growth of Indian marshy ground is rice, but the dry banks around furnish the hot peppers which are wholesome as seasoning. After heavy summer-rains in England, myriads of acrid milky Agarics spring up, in dank woods and situations where malaria produces disease, which it is by no means impossible these pepper-mushrooms may be a cure for; many common medicines would produce, as much pain, distress and contortion as *Agaricus rufus*, if taken in two ounce doses; a raw Capsicum bitten carelessly has caused swelling of the lips and face to a fearful extent, yet no one fears to eat them pickled; mild, bland arrowroot is made by depriving the vegetable of its acrid poison, and thus the Cassava is rendered a substitute for bread to a whole people on the Mosquito shore; but though cooking or pickling may remove the evil qualities of milky Agarics by abstracting their acrid juices, yet they evidently do not become dainties to please the palate, let us then rejoice and be thankful that in England we are not under the necessity of trying experiments upon them to appease hunger.



PLATE XVI.

HYDNUM REPANDUM, *Linn.**The common Hydnum.*

Gen. Char. Hymenium of the same substance as the pileus, composed of free spine-like processes. Name from ὕδνον, the classical name for a Fungus¹ which has been confounded with the true Truffle.

Spec. Char. HYDNUM REPANDUM. *Pileus* fleshy, more or less repand, smooth, zoneless; from two to four inches broad, the margin often arched, irregular in form, lobed or undulated, buffish, smooth. Spines unequal, pale, conical, entire or sometimes bifid, or lacinated, even compressed or lamellated. Stem from one inch and a half to three inches high, one inch thick, solid, paler than the pileus, sometimes clothed with white down, and at the apex with aborted spines, almost always excentric, often lateral. There is a variety which has the pileus redder and tomentose, and the spines pale cinnamon.

Hab. Borders of woods and upland pastures, in large rings, or gregarious groups.

In the account given of the Boletus tribe, it was stated that their distinguishing character, the arrangement of the membrane containing the spores, is that it *runs up and lines* the tubes of which the under part of the pileus is composed; in the *Hydniums* the position of this membrane is reversed, for it *covers over* each of a mass of spinous processes, proceeding from the under side of the cap; this spinous formation of the hymenium has gained for the *Hydnum* various descriptive soubriquets, as “Arresteron”, or Little Rake, in Gascony; “Barbe de Vache” in the Vosges; “Steccherino”, from the sticks of a fan, in Italy; in all these countries it is considered an excellent article of food, and is so marked in character as quite to preclude mistake. Our present subject, the *Hydnum repandum* is the most palatable, but others are eaten, and none are unwholesome.

In shape and consistence there is a resemblance between the *Cantharellus cibarius* and this *Hydnum*; they both are apt to taste rather acrid when raw, but beyond this general resemblance the likeness fails; the colour of the *Chanterelle* is rich yellow, that of the *Hydnum* buff leather colour, in which a yellow shade has no share; the hymenium also of the *Chanterelle* consists of veins and corrugations, instead of spines; the two plants delight in similar situations, are brought to the foreign markets at the same season, may be cooked in the same manner and are equally safe, so that any confusion between them is only to be deprecated in a botanical point of view. As we have no vulgar name for the *Hydnum* except the general and opprobrious one “toadstool”, the calling it “common” *Hydnum* is likely to lead to mistake, for it is by no means with us a common Fungus; true it is that in particular spots *repandum* is descriptive of its mode of growth, in great troops or bodies, often in immense rings, but in some parts of England it has never been seen, and probably is shy of the plough and spade, like most of the Fungus tribe; during successive years it may be collected under oaks and other forest trees, on the borders of old woodland and in parks, it abounded near Tunbridge

¹ Probably *Rhizopogon albus*.

Wells in the autumn of 1846, and from experience at that period, may be strongly recommended when thoroughly stewed in white sauce; the flavour is extremely good, the substance digestible, and a resemblance to oysters perceptible to some palates. It is the *Chevrotine* of the French; and is much eaten in Austria.

However strong English prejudice may be with respect to the Fungus tribe, it is founded on fear, and even those who grieve most at the neglect and waste of valuable species, cannot blame the caution of the ignorant. To remove ignorance will it is hoped be to banish fear, and every one who will take the trouble may easily identify *Hydnum repandum*; the only mistake likely to be made, is with its relative *Hydnum imbricatum*, a large variety with a strikingly scaly pileus, rare in England although frequent in Germany, where it is always eaten, but not esteemed so much as its more delicate relative. To recapitulate,—the *H. repandum* is a buff-leather coloured Fungus, not scaly on the pileus; the under side is thickly set with spines of a paler colour than the cap, these are generally round, but apt to be deformed, and are easily broken off, they may however readily be known as distinct from any tubular or pored hymenium; “every spine consisting of an interior flesh-coloured substance, which appears to the eye darker, juicy, and watery, and which forms a sort of kernel to a second tender transparent membrane, consisting of sporophores and spores, and which is the hymenium” (Kromb.); now it is evident that such spines composed of a double substance, may, when broken or injured, put on the appearance of rude tubes, it must then be remembered that the dust or spores are situated *within* the tubes of such Funguses as possess that structure, but *outside* of the processes of the *Hydnum*; laid on a slate or glass these spores will be found as a white deposit. If then any Fungus of a fleshy description (for there are coriaceous *Hydnums* not to be supposed eatable) has a spinous hymenium, and a pileus free from scales, it is probably our subject. Its shape is very irregular, lobed, and waved, often depressed in the centre, and the stem lateral; when many grow together they are often confluent both in the pileus and stem; the flesh is white, firm, elastic; occasionally a flesh-coloured tinge pervades it; it is entirely homogeneous or one with the stem, and has no very perceptible taste or smell; in age, in very dry weather, or when bruised, a cinnamon tint is assumed by the Fungus, and the whole darkens in drying; it then becomes tough and leathery, and our experience cannot certify that it is of any use; it does not afford ketchup, having little natural moisture, for which reason young and fresh specimens only should be selected for the table; these must be cut in equal sized pieces, steeped in warm water and afterwards thoroughly stewed either in rich brown sauce, or white enriched with cream or butter; it is not of a substance proper for broiling; that operation rendering it tough and indigestible.



A.M.H del

1, *Scleroderma verrucosum*, Bull. 2, *S. vulgare*, Fries.

on stone by Reeve, Brothers

PLATE XVII. Fig. 1.

SCLERODERMA VERRUCOSUM, *Bull.**Warty Scleroderma.*

Gen. Char. Peridium rooting, hard, clothed with an innate bark, bursting irregularly; flocci adnate to the whole interior of the peridium. Spores simple, placed in minute heaps. Name from σκληρός, hard, and δέρμα, the skin.

Spec. Char. SCLERODERMA VERRUCOSUM. Substipitate, peridium rounded, subverrucose, thin and brittle above, pulp black-purple. Flocci and spores brown.

SCLERODERMA verrucosum, *Fries, Persoon, Greville, Berkeley.*

LYCOPERDON verrucosum, *Bulliard, Withering.*

———— defossum, *Sowerby, Withering.*

Hab. On hedge banks, under oaks in pastures.

Few persons who have picked up these small hard-coated puff-balls, would suppose they had ever been confounded with the subterranean Truffle, yet this is the case, and as the smell when broken is peculiarly unpleasant, resembling nothing with which to compare it, and the inky hue of their contents is not calculated to improve confidence in the virtues of the *Sclerodermas*, we can imagine the consternation of an old English cook, when offered such repulsive little individuals, for that foreign luxury the Truffle; most excusable in such a case would be prejudice in favour of John Bull's roast beef as compared with outlandish dishes.

It will, perhaps, be doubted if ignorance so complete of what a Truffle really is could exist. Certainly it did, and does, in parts of the country where the *Tuber cibarium* is not commonly collected; the professed Truffle hunter, who easily turns a pound weight of his spoils into half-a-crown, jealously guards his knowledge from the vulgar; he tells the inquirer, as he told White of Selborne, years ago, that "he knows of many kinds," and misleads, as far as he can, every one whose researches are likely to interfere with his gains. Poor country people becoming aware that an edible delicacy, which is bought at a good price for the tables of the rich, grows in the neighbourhood, and finding something resembling it according to their ideas, offer for sale, not only the right, but the wrong thing very often; and their assertions and recommendations should be received with the greatest caution; *Sclerodermas* for Truffles; Horse-mushrooms instead of the wholesome *A. campestris*; a large *Peziza* or the bottom of an exhausted puff-ball, for flap-mushrooms; mistakes of this kind are not so much to be attributed to cupidity, as to ignorance, and want of that habit of minute discrimination, which general education gives to the mind. Many poor people might be well employed in bringing from the field and woodlands, at early day, Fungus treasures which the more delicately constituted botanist

¹ From γαστήρ, the *stomach*, and μύκης, a *fungus*, hymenium included in the receptacle.

² From θρίξ, a *hair*, and γαστήρ, the *stomach*; receptacle filled with floccose hairs on which the spores are placed.

would fear to seek, but we caution him not to take the word of any country man or woman, as to the wholesomeness of the various articles. It is better to direct that all Funguses met with, shall be carefully excavated and brought in, giving a shilling or two, according to quantity, and then to select for yourself. Thus many dainties may be procured which otherwise would spoil and be useless in the day, and there is no village where some poor widow or other deserving object, may not earn in this manner during the autumn, a small fund to shield against the 'Union' in winter. Many a delicate lady may thus study these denizens of spots she would fear to explore in person, for it is in out-of-the-way wild places, far from carriage tracks, and often where large herds of cattle are pastured, that they chiefly abound.

PLATE XVII. Fig. 2.

SCLERODERMA VULGARE, *Fries.*

Common Scleroderma.

Spec. Char. SCLERODERMA VULGARE. Subsessile, irregular, peridium corky, hard, bursting indefinitely, filled with blue-black pulp, spores at length brown.

SCLERODERMA vulgare, *Fries, Berkeley.*

LYCOPERDON aurantiacum, *Bulliard, Sowerby.*

TUBER solidum, *Withering.*

Hab. Under oaks in pastures, not uncommon.

At first sight the *Sclerodermas* may be confused with the soft-skinned *Lycoperdons*, but the touch will prove the difference, and the colour of the contents is inky when cut across, even while quite young, whereas the ripened pulp of the *Lycoperdons* is of an olive brown or green hue. The latter are edible in their early stage, the *Sclerodermas* are never so; they are said to have powerful *medicinal*, which (without intending it impertinently) is only another name for *poisonous* qualities, if taken in sufficient quantity for food; they certainly provoke a propensity for pelting, few persons picking up, without afterwards disposing of them in this manner.

“ My Phillis me with pelted puff-balls plies,
Then tripping to the woods the wanton flies.”—*Dryden.*



F. R. del

Clavaria frutiformis, Sowerby

ex. sculp. by Reeve Brothers.

PLATE XVIII.

CLAVARIA INÆQUALIS, *Müll.**Irregular Yellow Clavaria.*

Gen. Char. Receptacle erect, more or less cylindrical, homogeneous, confluent with the stem; hymenium occupying the whole surface.

Spec. Char. CLAVARIA INÆQUALIS. Fasciculate, unequal, brittle, yellow or yellow-white, acute, irregular, somewhat tufted or gregarious, fragile, compressed, angular, channeled, often bifid and variously cut and jagged at the apex; more or less ventricose, smooth and mostly yellow but sometimes whitish.

CLAVARIA inæqualis, *Müller, Fries, Greville, Berkeley.*

——— *vermiculata, Sowerby.*

Hab. In grass, after stormy weather.

The Funguses of this genus are (like all others) distinguished by the position of the receptacle, which is erect, homogeneous, smooth, confluent with the stem, and covered exteriorly with the fruit-membrane or hymenium; the ripe spores fall out as dust of various hues, white or ochraceous, and may be seen like a bloom or slight mouldiness shed from one part upon another, or ejected on any dark smooth surface in a correct pattern of the branched madreporé-shaped stems. There are many species, which vary much in colour and form; the extremes being a fleshy moss, or a simple horn, in appearance. Some are most delicate articles of food, and Vittadini recommends them when gathered fresh, as extremely digestible and agreeable; unfortunately they are not common enough in our woods and meadows to make this recommendation generally useful. A course of stormy weather with heavy rains, produces them in autumn, but not in large quantities any where in England that we are at present aware of. The *Clavarias* are all of a fleshy, not coriaceous substance, nor fibrous, although some become rigid when dry, and can be preserved in that state. Many are branched, their stems being fasciculated and the whole growth resembling that of a cauliflower; these are the best for the table having much substance in the stems, which when cooked are of a very good consistence; the upper shoots, becoming flabby when stewed, and apt to retain any sandy grittiness should, be trimmed off. Other *Clavarias* preserve the true character of the genus, a simple stem, growing larger to the summit like a club; others again as our *C. inæqualis* are slightly swollen in the middle and again restricted, or have throughout uniform vermicular proportions.

The student will find many Funguses called *Clavaria* in the older botanical works, now divided from that section, which is confined to the strict limits laid down in the general characters given above. *Typhulas* and *Pistillarias* are minute members of the natural family *Clavaria*, but they are parasitic on other vegetables;

¹ From *clava*, a club.

Caloceras which have the closest affinity will not be confounded with it, if the simple difference is remarked, that all the true *Clavarias* are dry and persistent, the *Caloceras* slimy and deliquescent. In *Geoglossum spathularia* and *Mitrula* a great natural distinction takes place, they have sporidia, packed in asci for the fructifying principle, instead of the simple spores of *Clavaria*, and are now therefore formed into a separate family under the title *Geoglosseæ*.

We owe so much to the pains-taking laborious pioneers, the Witherings, Sowerbys, &c., who have observed and noted, that it is with a sort of pious sorrow we relinquish their works, superseded, but not altogether set aside, by more perfect arrangements and improved nomenclature; for *original* observations are always valuable; in referring to these older works it is only requisite to take care to identify the object described, and to ascertain synonymes correctly. Sowerby's book has fortunately escaped a modern editor, and if any young Mycologist should possess the third edition of Withering, corrected by the author's own graphic pen only, he would make a woful mistake in exchanging, like Aladdin's lamp, the old for new.

Great geniuses have occasionally sprung up. "What! genius for Mycology?" Yes! even so. Forgive us, Poets and Painters! there may be such a thing as genius receiving a direction even into a channel so apparently dull as that; like bright waters in similar bounds, still a vivifying influence, it is still genius, though employed in giving lucid arrangement to Toadstools, and with inadequate means, and under disadvantages such as must deter all but intent master-spirits, working bravely on; to her zealous and faithful worshippers, nature vouchsafes as it were, revelations, withheld from the timid, or listless, or mercenary. Such men were Clusius, whose shattered frame and painful existence were no impediments to his "labour of love"; Micheli, who saw better, by inward inspiration, with the imperfect microscopes of his day, than any of his successors, and whose investigations the perfection of modern instruments verifies, to the exclusion of intermediate error; and Ray,—an oration in praise of Ray we must leave to the society who honour his memory, simply recording our opinion, that if ever true genius existed it was enshrined in John Ray, who looked through all the wonders of "Creation" to find the "Wisdom of God" therein—and, returning to the half-finished sentence interrupted by sentimental doubts, we venture to affirm that labourers in the field of Mycology have occasionally sprung up, by whom tasks have been performed which nothing less than genius could enable them to accomplish.



Agaricus aimatochelis, Bull.

PLATE XIX.

AGARICUS AIMATOCHELIS, *Bulliard*.*Bloody-cinctured Agaric.*Series CORTINARIA.¹Sub-genus TELAMONIA.²

Gen. Char. TELAMONIA; veil consisting of arachnoid fibres woven into a sub-persistent ring. Stem solid, at length softer within, firm fibrillose. Pileus more or less fleshy, the margin thin, campanulate or convex, then expanded, dry, squamulose or fibrillose. Gills adnate or emarginate, broad, distant, changing colour. Large firm fungi growing on the ground.

Spec. Char. A. AIMATOCHELIS. Pileus from four to six inches across, uniform rich cinnamon-brown, inclining to pallid brick-red, sericeo-fibrillose, obtusely umbonate, margins incurved; fleshy at the centre, thin towards the margin. Stem solid, from four to six inches high, attenuated upwards, fibrillose, encircled by a red stain at the point where the ring was attached. Gills adnate, cinnamon.

AGARICUS aimatochelis, *Bulliard*.———— hæmatochelis, *Fries*.Lc Fuseau Rubanier, *Paulet*.*Hab.* “In beech woods, rare”; *Fries*. At Holwood, Kent; September 1840. New to English Botany.

This is a most elegant Agaric, and its girdle of sanguine tint, which gained for it the title “Rubanier”, of *Paulet*, is quite a distinctive mark from all others; many have stains of various hues, left where the ring has been, but these stains are generally caused, either by a deposit of spores, retained by the fragments of the ring itself, or by the remains of the universal curtain forming coloured fibrillæ below the point where they were woven into the ring. All these various markings so caused upon the stems of Agarics have generally some connexion in colour with the shades which tincture the rest of the plant, but in *A. aimatochelis* the red ribbon is the only red thing about it, and whence it derives that hue, and “why” it should be confined to one narrow band, and neither extended by spot nor shading into the neighbouring texture, is one of those questions to which the fitting “because” is fortunately of no great importance, as it is likely to remain undeclared. “Because” it looks pretty, is quite reason enough to satisfy those who know how much Nature loves to adorn her works, and certainly by giving to the elegant uniformly-tinted *Aimatochelis*, the relief of a little bright colour, she has added a grace, and proved herself no Quaker. “Because” it is a distinctive mark from some of its congeners, and is to identify it, as useful and valuable, or noxious and

¹ From *cortina* a veil; spores reddish-ochre. Veil arachnoid.² From *τελαμών*, lint.

worthless ; but no, much as we delight in tracing design and finding motives for even the colour of an Agaric, in this case there seems no good or evil depending upon it. "It does not hurt dogs", that is all Mons. Paulet discovered, and we know. The *A. aimatochelis* is one of those Funguses which like *A. violaceus* supports itself among dead leaves, attaching to them a cottony web, or mycelium, by which means it is sustained erect. It has the smell of an *Oreades* in a faint degree, and being agreeable to the taste, is most likely good for food, but so rare that when found it will be probably preserved as a treasure for the Hortus Siccus, instead of being sacrificed to the Table.



B.



A.



A. *Thelephora purpurea*, *Persoon*. B. *T. cærulea*, *Schrader*.

PLATE XX. A.

THELEPHORA PURPUREA, *Persoon*.

Gen. Char. Hymenium homogeneous and concrete with the pileus, even or papillate, its whole surface bearing spores. Name from $\theta\eta\lambda\eta$ a nipple, and $\phi\acute{\epsilon}\rho\omega$ to bear, from the papillose appearance of the hymenium in many species.

Spec. Char. THELEPHORA PURPUREA. Imbricated, soft but coriaceous, rigid when dry, zoned, margin waved and plicate, colour variable, often with a blackish zone near the margin, hymenium smooth, purple or lilac, in age dusky.

THELEPHORA purpurea, *Persoon*, *Fries*, *Greville*, *Berkeley*.

AURICULA reflexa, *Bulliard*.

———— persistens, *Sowerby*, *Purton*.

Hab. On wood, old stumps, rails, dead branches lying on the ground; all the year.

All *Thelephoras* commence their growth as minute, more or less downy patches, quite adnate to the substance, whether bark, planks, &c., on which they are found; in this state they are called *resupinate*, that is *topsy-turvy*, the fertile surface being upwards, which is contrary to the true character of the *Pileate* tribes. A few species remain to the end entirely resupinate, never turning over at all so as to form a pileus, but the greater number elevate themselves at one edge, and extend their growth upwards in that direction, remaining fixed by the other extremity; then the free side swells and becomes a pileus in its usual sense, thus forming variously lobed, often densely imbricated masses; the student will be obliged to watch carefully the successive stages of development, in order to discriminate between the imperfect state of those kinds which form a pileus, and the mature condition of those which never do. A few *Thelephoras* have stems, but the general character of their growth is sessile, seated or attached by a portion of the pileus. *Thelephora purpurea* is a good example of the sessile kinds, it is produced in confluent patches on decaying timber; a stump being frequently frilled over with a congeries of its elegant lobes, which are flexible when moist, drying up and becoming brittle and coriaceous during parching winds, but again swelling out into soft downy masses, after rain; in these varying conditions the present subject lasts many months, as do others of the family, but although there may be successive growths of the plant about the same site for years, it is not truly perennial, in the sense of the same individual pileus enduring for that period. *Thelephoras* are destitute of pores: a distinguishing characteristic from the whole tribe of *Polyporus*, some varieties of which in the young state approximate to them closely. It may be as well here to remark that general descriptions apply only to the perfect state of plants; a young puff-ball and a button mushroom are at first sight alike; inexperience must wait till the shapeless cotton which is the early development common to many *Thelephoras* and *Polyporuses*, has assumed features before a decision can be made to which class it belongs: perhaps we must acknowledge that our present subjects are *featureless*; Sir J. E. Smith evidently thought so, when after trying to fix on distinctive characters he says “when their *smooth* surface discharges powdery seeds they are to be considered

as perfect species of *Thelephora*", agreeing with him that this is "rather vague", we can only improve upon it by distinctions of a negative kind; they never have pores, like the *Polyporus* family; the hymenium is never a gelatinous membrane like those of *Exidias*, *Tremellas*, &c., with which they were formerly classed under the general name *Auricularia*,¹ from a fancied resemblance to the ears of animals. The surface from which the spores are emitted is of a smooth velvet texture, without veins or teeth; in some varieties little eminences or tubercles (whence the name) arise in it, but the texture is not affected thereby. The upper surface of those which possess a pileus, is often zoned, wrinkled, and covered with shaggy down or velvety plush. The substance is altogether concrete and homogeneous, that is, of one substance, not of two parts which can be pulled away from each other, as the tubes and flesh of a *Boletus* may easily be, thereby showing their distinct nature.

PLATE XX. B.

THELEPHORA CÆRULEA, *Schrader*.

Spec. Char. Effused, confluent, adnate, sub-tomentose, bright-blue, at first byssoid, but when fully developed forming a close membrane, following the undulation of the wood on which it grows. Of a beautiful dark satiny blue, the margins whitish.

THELEPHORA cærulea, *Schrader*, *Fries*, *Berkeley*, *Persoon*.

BYSSUS phosphorea, *Linnaeus*, *Withering*.

AURICULARIA phosphorea, *Sowerby*, *Purton*.

Hab. On very wet decaying wood, sticks, rails, &c.

This is one of those *Thelephoras* which continue always resupinate, the seed-surface uppermost, never forming anything resembling a pileus; it consists at first of very fine short upright down, "much finer than the finest wool" (*With.*); it resembles in fact effused velvet, forming a beautiful blue film with downy margins, over extremely decayed moist wood, to the sinuosities of which it closely adapts itself. *Fries* describes it as beset with bristles in with state it probably was seen by *Withering*, who, following *Linnaeus* classes it with *Byssus*, and says "it has the joints rather long", *Mr. Berkeley* had not however verified this fact, and certainly they are not present in many specimens, perhaps appearing only at one period of growth. *Thelephora cærulea* abounds in the woods of *Sussex*, the peculiar colour will always serve to identify it, and it is one of the most striking instances which can be pointed out, of the manner in which nature replaces one form of life by another, at the same time veiling inevitable decay in a robe of beauty.

¹ The genus *Thelephora* was separated from *Auricularia* by *Fries*, on account of the quaternary arrangement of the spores.



Polyporus dryadeus, Persoon.

on stone by Neeve Brothers

PLATE XXI.

POLYPORUS DRYADEUS, *Persoon*.*False Amadou.*

Gen. Char. Hymenium concrete with the substance of the pileus, consisting of sub-rotund pores, with thin simple dissepiments. Name from *πολὺς*, *many* and *πόρος*, a *pore* in allusion to the numerous pores of the hymenium.

Spec. Char. POLYPORUS DRYADEUS. Sessile at the foot of oaks, forming imbricated, irregularly confluent masses from one foot, to two feet or more across; each main division of the pileus is from eight inches to a foot in diameter, and from two to three inches thick; rather soft, grossly tuberculated, the margins swollen, resembling a honey-comb, being filled with pits which at first contain drops of glutinous slightly astringent, sub-acid liquor; as this dries the edges become black and the pits disappear. In youth the whole plant is pale grey with lemon-coloured or whitish margins, in its after-growth cinnamon-brown both surfaces becoming covered with a velvety grey-white substance, like the bloom of fruit, receiving the minutest impression of the Fungus, and turning brown where touched. The pored surface is nearly plane, grey-cinnamon, the pores are extremely minute, the tubes very long, particularly near the base, where they measure from a half to three-quarters of an inch in depth; the mass of pores contracts in drying forming deep cracks down to the fibres of the pileus which run at nearly right angles to them. The substance of the pileus when dry is fibrous, not corky, reddish brown as well as the tubes. The whole plant is heavy when fresh, but loses much of its weight and volume in drying. It grows very quickly, but a pileus of the previous year sometimes endures through the winter, and new growth takes place from it. It is at most biennial.

POLYPORUS dryadeus, *Fries, Berkeley*.

BOLETUS dryadeus, *Persoon*.

——— pseudo-igniarius, *Bulliard*,

Hab. At the foot of an aged oak, Hayes; August.

We have before mentioned that the tribe *Polyporus* was formerly included in *Boletus*, but removed from that class by Fries; *Boletus* remaining the title of the soft-fleshed family with central stems, whose tubes easily separate from the distinct flesh of the pileus, while *Polyporus* includes those more or less coriaceous and generally parasitic individuals, the pores of which are, as in *Boletus* the orifices of tubes; but whose tubes are concrete with the substance of the pileus, and cannot be pulled away from it, even when, as in the case of *P. dryadeus* our present subject, the tubes bend away at right angles to the horizontal fibres of the pileus.

“Hitherto”, says Bulliard, “this *Boletus* has been confounded with the *Amadou*, which error would not have taken place if it had been remembered that the *Amadou* grows very slowly, that it has very short tubes, and that they are never separated by crevices whether fresh or dry”, other distinctions he gives, taking much pains to set at rest which fungus is the valuable article to which modern surgery is so much indebted.

In its proper place we hope to follow his good example, therefore now need make no further remark on *Amadou*, than that our present subject is a pretender to the title. *Polyporus dryadeus* is not common, and is so remarkable from the manner in which it is charged with moisture that it cannot be mistaken when met with, as this peculiar talent for distillation is not possessed by any other of the tribe; whether the liquor thus abstracted from the parent oak by a natural alembic has properties more valuable than human art could evolve, we do not know, but the astringent sub-acid flavour makes it probable that it contains the same medicinal properties as oak-bark, although being only a modification of the sap in a slighter degree.

It is very variable in size and shape according to the site or season, and in colour, according to its age, or exposure; a specimen which grew in Hampshire to a very large size, being described as resembling "very homely pie-crust covered with scorched flour", this specimen was also composed of two or three large, nearly plane, pileate pieces, lying one over the other, and the drops of moisture were much less abundant and more minute than in the Kentish specimen according to its entire bulk. Hard and woody as *P. dryadeus* is when dry it encloses in its substance ivy, briars, or grass, which remain flourishing greenly, in despite of the suffocating embrace of the Fungus which became effused around them in a soft state; this is the case with many hard coriaceous members of the *Polyporus* and *Daedalia* tribes and proves how rapid their early development must have been.

Angas mentions that, in the woods of New Zealand, large Funguses of these kinds stand out from the parent trees so boldly and rigidly, as to make commodious seats; he does not enter into any details as to species, and it is a pity that intelligent travellers, who would blush to make any statements as to trees and flowers that were not scientifically correct, dismiss poor neglected mycological specimens with "A Fungus"; let us hope there may yet be a "Diffusion of Knowledge" on this subject also.



A.M.H. del.

Boletus Pachypus, Berk.

Reese, Brothers lith. et imp.

PLATE XXII.

BOLETUS PACHYPUS, *Berk.*

Gen. Char. Hymenium distinct from the substance of the pileus, consisting of cylindric separable tubes. Spores oblong. Name from $\beta\acute{\omega}\lambda\omicron\varsigma$, a *ball*; from the rounded form of many of them.

Spec. Char. B. PACHYPUS. "Pileus six to seven inches broad, dry, pulvinate, subtomentose, pale reddish brown, very thick and fleshy, when young firm, when full-grown very soft; flesh white, not changeable. Tubes free, at first lemon-coloured, afterwards dirty yellow, simple. Stem three to four inches high, two inches and a half thick, bulbous, often swollen from the top, rarely equal, reticulated, yellowish when young, sub-rufescent when old. Sometimes two or three specimens spring from the same root." "The tubes do not become blue when touched." "Another form, with the tubes at first bright yellow, the stem extremely thick and not in the least reticulated, but rough like that of *B. scaber*, and neither flesh nor tubes changeable, occurred in May at King's Cliffe, Norths. Spores pale olivaceous ochre. Taste and smell like that of *A. Georgii* (the Horse-mushroom); the yellow expressed juice distinctly acid.

BOLETUS pachypus, *Berkeley*, *Fries*?

Hab. Under trees on a hedge-bank, Wymondham, Norfolk, June.

The large varieties of Boletus have a similar rude hastily developed irregular growth, often compressed and distorted from meeting with obstacles to their swelling out equally in every part of the pileus; specimens of *B. edulis*, *B. pachypus*, *B. scaber*, &c., may be so aberrant from their true nature, as at first sight to be taken for each other. The attempt to fix on positive specimens of each species to give the student correct ideas of them is so far difficult, that the definitions of our present authorities, are not very ample or strict, nor accordant with each other; and this is not surprising since ill-grown, or over-grown, or diseased Boletuses are constantly presenting themselves, which it is an exercise of botanical acumen to refer to their proper place; the patience and ingenuity of the student will find ample scope in classing a basket of mixed Boletuses produced as they often are in large quantities, after heavy summer-rain, partaking of every form and colour, and varying not more from their kindred, than from themselves, according as they are affected by soil and situation, by temperature and weather. The changing colour when broken may certainly be depended upon in determining any Boletus, so far as the intensity of the blue or any other shade acquired by the exposure of the juices to the air, may vary according to the moist or dry state of the flesh, or its age, but a changeable Fungus is changeable always, and does not turn blue at one time and not at another; if therefore any Boletus is cited as turning blue, and another as not doing so, they may be near relatives, but not the same although their outward resemblance should be considerable. An unerring test is the colour of the spores, which may be collected by placing the pileus on a glass, the spores of a given individual being always of the same hue. Some of the Boletus tribe when their tubes are longitudinally divided, are found to have them quite simple, others have compound tubes, which means that at some distance from their attachment to the pileus, they

branch into several pipes with distinct orifices ; this structure must be attended to in full grown specimens, in young ones it is not so apparent, but only the mature Fungus should ever be depended upon for botanical character.

With the descriptions of two varieties of Boletus given by Mr. Berkeley, under the name of *pachypus*, our subject agrees, having points common to both ; ours was *firm when young*, and the large specimen had become *very soft in age* ; in the young one the stem was obscurely *reticulated*, which disappeared, as the texture grew rough with time ; two or three *young plants* sprang from the *same base*, and the spores were a *pale olivaceous ochre* ; the *juice* was *acid*, and the smell agreeable resembling an eatable mushroom. Our Fungus likewise agreed with the descriptions cited above in being *unchangeable* ; neither tubes nor flesh became blue ; and in this respect they all differ from *B. pachypus* of Fries ; whether therefore his Fungus and ours be intrinsically the same may perhaps admit of doubt, but our plate is the Boletus that Mr. Berkeley describes under that name. With *Boletus pachypus* Fries gives a variety he calls *B. amarus*, which at present has escaped our observation ; this *amarus* is the *B. pachypus* of Krombholz, who says “beware of eating it”, one would have supposed it to be its own sufficient caution, as he adds that it differs from all other tubed Agarics by its disagreeableness, and assuredly to be the most disagreeable of Boletuses is no slight dis-praise ; “it has an oily smell of bugs, and the taste is bitter and nauseous, the skin of the pileus being particularly bitter, it grows in the deciduous woods (as distinguished from pine forests) of Northern Germany, in summer and autumn ; seldom in spring”. Its general growth resembles *B. edulis*, when we introduce that excellent species to our gastronomic friends it will be time to point out clearly their discrepancies ; knowledge of Mycology, however, is not intended to supersede the senses of taste and smell, and those who possess such valuable gifts need not learn to consider them mere vulgar prejudices.





PLATE XXIII.

AGARICUS RUBESCENS, *Persoon*.*Reddening Fly Agaric.*Series LEUCOSPORUS.³Sub-genus AMANITA.⁴

Sub-gen. Char. AMANITA. Veil double; one universal, covering the whole plant in a young state, distinct from the epidermis, at length burst by the protrusion of the pileus, part remaining at the base of the stem, part either falling off, or forming warts on the pileus; the other veil partial, at first covering the gills, and afterwards forming a reflected sub-persistent ring on the top of the stipes. Stem stuffed, at length hollow, squamoso-fibrillose, thickened at the base. Pileus with the disc fleshy, the margin thin, campanulate, then plane, viscid when moist. Gills attenuated behind, free, broader in front, ventricose, close, but little unequal.

Spec. Char. AGARICUS RUBESCENS. Pileus convex, then expanded and nearly plane, vinous-red, greyish-brown, or inclining to buff, but with more or less lake in the tints; clothed with pale unequal mealy warts, the margin smooth and even, not striate, though in old specimens sometimes appearing so, in consequence of the backs of the gills shewing through the epidermis. Flesh turning red when bruised or pierced by insects. Gills watery, white, broad in front, narrow behind, adnexed to the stem, by a fine line. Stem stuffed with a cottony substance, afterwards becoming hollow, bulbous, attenuated upwards, scaly; ring large, deflexed, patent, persistent. Pileus from three to four inches broad, stem two to three inches high. Volva very fugacious (obliterated).

Hab. In woods, summer and autumn.

To rescue merit from undeserved obloquy is always a praiseworthy undertaking; but when the knight-errant puts spear in rest to fight the battle of a pretender, his chivalry, however easily it may run away with his better judgement, does not carry ours along with it. The *Dulcineas* of Il Dottor Carlo Vittadini are of doubtful reputation to begin with, and *Agaricus rubescens*, recommended and defended by his eloquent enthusiasm, cooked, eaten, and pronounced “sano”, can never be considered other than “sospetto”; an esculent Agaric should be like Cæsar’s wife—above suspicion. That Vittadini ate this Agaric several times without derangement of health is certain, but he might have done the same with *Agaricus muscarius*, its near relative, which is not injurious in small quantities. *A. vaginatus* we have ourselves eaten with impunity, taking only one for our share, whereas by appropriating several, their narcotic property, according to the German authorities, might have produced alarm. An article of food cannot be considered wholesome, unless

¹ From ὑμῆν, a *membrane*, and μύκης, a *fungus*.

² From *pileus*, a *cap*.

³ From λευκός, *white*, and σπόρος, a *seed*.

⁴ A name given to some Agaric by Galen.

like a potato or haricot, all the world may satisfy appetite by making a meal of it; and the result of various testimony as to the qualities of *A. rubescens* is certainly not favourable. The ketchup made from it, spoils almost immediately, becoming ammoniacal and slimy, the Agaric itself taken in small quantity when broiled, is certainly not unpalatable, but the statement of that very exact, and in esculent Funguses unquestionable authority, Paulet, has always prevented our trying experiments on ourselves, which do not seem to have agreed very well with his dogs. Nothing can be more fallacious than judging of the qualities of a Fungus from its being the food of insects and snails; the latter particularly delight in such as have acrid milk (old Gerarde would, perhaps, account for it on the principle of things, "hot in the first degree", being wholesome for those of a "cold" constitution) and there are very few of the soft-fleshed tribes, all of which are the nurseries of innumerable insects, so much in favour as the poisonous *Boletus luridus*, on breaking an old one it is a living mass of larvæ. Our present subject is so soon attacked by insects that it is very rare to find specimens devoid of wriggling life, and being a very common and abundant kind, it must be of great service in the economy of insect existence. This is a use for it, sufficient to satisfy the inquirer that nature never wastes her resources, for if it should seem a pity that so many Agarics should not be made into food for man, it may also be a pity that he should rob so many maggots of their subsistence, or, at any rate, make an entomological meal when he only intended a mycological one. *Agaricus rubescens* has much beauty in a young state, the warts are the remains of a universal veil or volva, which is fugacious, or, as it is styled, "obliterated", the ring when carefully detached from the edge of the pileus, retains the impression of every gill which it protected, and the gills are like carved ivory; if bruised it becomes reddish, and so it does where pierced internally by the insects, so that at last the clean delicate ivory texture, turns to a dingy-red disagreeable mass of decay; in wet weather this is very rapid; few Agarics give out so much liquid in their deliquescence, which it is a waste of courtesy to style ketchup, where *A. rubescens* is the subject operated upon.

The colour of the epidermis varies, but a vinous-red is the prevalent tinge. The subject of our plate is in youthful perfection.



PLATE XXIV.

POLYPORUS VERSICOLOR, *Linnæus*.*Parti-coloured Polyporus.*

Gen. Char. Hymenium concrete with the substance of the pileus, consisting of sub-rotund pores with thin simple dissepiments. Name from *πολὺς*, *many* and *πόρος*, a *pore*, in allusion to the many pores of the Hymenium.

Spec. Char. POLYPORUS VERSICOLOR. Variable; sometimes quite resupinate, or with the margins reflexed; more generally dimidiate and densely imbricated, occasionally spuriously stipitate; pilei more or less lobed, coriaceous, villous, with various coloured more or less shining, regular concentric zones; generally smooth, but sometimes the whole surface is villous and the zones mere depressions. Pores round, white, or cream-coloured in age, lacerated. The whole plant rigid when dry, in which state it does not easily decay, although the growth is truly annual.

POLYPORUS versicolor, *Fries*, *Berkeley*, *Greville*.

BOLETUS versicolor, *Linn.*, *Bull.*, *Sow.*, *With.*

Hab. On stumps, rails, stakes &c.; extremely common.

Although in the course of this work it may be desirable that any new or rare Fungus should be portrayed for the experienced Mycologist, it is also necessary that the student beginning his "first steps", should have some simple and familiar examples given of each class, and therefore *Polyporus versicolor* is selected for the present illustration; it is easily met with, for every little plot of out-door premises affords specimens; if we saunter into the kitchen garden, the espalier or raspberry stakes probably have ruffles of it; the rustic trellis, the posts that support the bench, the very water-butt in the dingy town back-yard, may be adorned with an elegant congeries of its pileuses, fastened down and contracted at one edge, like striped velvet ribbon, plaited in scallops.

In its first stage this Fungus appears as circular white discs, depressed in the centre, which is buffish, and there minute pores like pin-holes soon develope themselves; in this state it increases to about an inch in diameter, the margin of the disc remaining smooth and firm, and the whole central surface consisting of shallow pores, the under side being tightly affixed to the wood beneath; this condition, which is called resupinate, because the plant is lying on its back, or upside down, it makes an effort to quit, and to assume the regular character of a pileated Fungus; rising therefore on one side it becomes what is termed dimidiate, or displaying half a pileus, and ultimately more or less free, even spuriously stipitate, this appearance of a stem being given by a prolonged mass of the pored formation, not by fibres composing a true stalk. When, as generally happens, a row of young plants is formed longitudinally upon the wood, they ultimately reflex over one another, becoming tiled or imbricated, while the folds of each pileus reflect the light like shot satin,

between which and velvet the texture varies. In any of the stages above described the development of the plant may be checked, so as never to attain its perfect state; sudden frost may arrest the swelling of the substance, and sudden warmth and moisture accelerate it, these changes affecting the configuration, as much as absence of light, or bright sunshine, do the colouring, so that a precise description cannot be given of an individual which wears such changeable apparel. Fair damsels, however, retain the same face, whether the last gay fashion displays its contour, or the cottage bonnet conceals it, and thus, although momentarily puzzled by a fanciful change of costume, we may recognize our pretty friend *P. versicolor* under it. On the other hand, a rival *Thelephora* or *Dædalia*,

“In velvet mantle bound with minever”,

may be accosted by mistake, but the features differ too much for any but cursory error; that is to say, quitting our figurative exemplification, *Thelephoras*, which in their imbricated masses and general growth, resemble this *Polyporus*, have not pores, but a smooth hymenium, and *Dædalia unicolor*, at first sight to be taken for a faded specimen of it, has a minutely and beautifully labyrinthine under-surface, whence its name, that cunning workman Dædalus suggesting the application.

The family *Polyporus* is very extensive, and admits of being arranged in various natural sections, according to distinctive characters, independent of the one great feature common to all its members, the pored hymenium. Our present subject, having “the pileus juiceless and firm, consisting of a thin fibrous cuticle heterogeneous as well from the hymenium as from the covering of the pileus”, belongs to the section *Inodermei* of Fries, and sub-division *Coriacei* which are “coriaceous, generally villous and concentrically furrowed, and are commonly banded with zones of another colour”, in a dry state they endure as if preserved for a Hortus Siccus, but are only annual in growth. In determining any species the student must remember, that specimens imperfect from youth, or distorted by growing in peculiar positions, or changed by the decay of age, may appear not only unlike the genuine type of the plant, but like some other. From the laceration of the pores in age, and the disposition of individuals unfairly compressed, to push into wider space, in order to expand a pileus, the present subject is often perplexing; Fries complains of its sporting in every way, and appearing under innumerable forms so that “you might easily divide it into a hundred species having no real existence”; he is, however, speaking of it as brought “from all parts of the world” including the tropics, in England it will be tolerably safe to refer a decidedly coriaceous *Polyporus*, with white or cream-coloured pores to “*Versicolor*” but not to let examination stop at that reference, a little trouble in verification is always advisable, and the student cannot attend too closely to minute differences, although, as in this case, they may not be of sufficient importance to establish a new species. Of the beauty of *P. versicolor* there can be no doubt, of its utility we know nothing, that is probably confined to its power of eliciting the principles of innocent and ornamental life from decaying wood, which instead of its own green leaves becomes adorned with flourishing growths of another kind. It furnishes a comfortable roof, and food, to various insects, which eat away the pores entirely, in some cases.



A. H. M. del.

Boletus laricinus, Berkeley.

Reeve, lith. et imp.

PLATE XXV.

BOLETUS LARICINUS, *Berkeley*.*The Larch Boletus.*

Gen. Char. Hymenium distinct from the substance of the pileus, consisting of cylindric, separable tubes. Spores oblong, of various colours. Name from βῶλος a *ball*, from the rounded form of many of them.

Spec. Char. BOLETUS LARICINUS. Pileus from two to six inches broad, dirty white with livid stains, at first clothed with yellowish slime, which gradually disappears, sub-squamose, often deeply scrobiculate, sometimes having adpressed fascicles of filaments, the remains of the shiny ring; tubes adnate, sub-decurrent, compound, each having two or three angular orifices, at first nearly white with a yellow tinge, then brownish from the ripened spores. Flesh yellowish-white, not changeable. Stem two inches or more high, from half an inch to three quarters thick, nearly equal, furnished with a ring, above which it is reticulated (from the pressure of the pores before the expansion of the pileus), frequently much scrobiculated below, dirty white like the pileus, stained with the spores, downy at the base. Spores brownish clay-coloured.

Hab. Under or near Larches, first found by Mr. Berkeley in Northamptonshire; afterwards at Keston, Kent, by Mr. Peete.

Some shrewd men of the world once determined to put a *bold* face on the matter, since a *handsome* one was denied them, and founded an Ugly Club, over which wit probably threw a halo, dazzling the eye into non-perception of the features; at any rate, it was politic to make ugliness a personal glory instead of disgrace, by thus affixing distinction to it. If among Funguses an Ugly Club were formed, *Boletus laricinus* would surely be elected to the President's clump of moss, without a dissentient Pileus objecting. Inelegant in form, livid in colour, veiled in slime (what an association with a *veil*), this Fungus may have rivals in repulsiveness, but none that we ever discovered. When past extreme youth it looks even worse than it is, the furrows in the cap (scrobiculate) give it a collapsed, wrinkled look of age; the discoloured stains have an air of decay, and altogether it reminds our eyes and fingers of the loathsome grey slugs which inhabit damp vaults.

This Boletus, which was quite a botanical novelty when first found by Mr. Berkeley, is of course unnoticed in any foreign authority. It was abundant in the one habitat at Keston, where it was also discovered, and attained the dimensions of the generality of large Boletuses, that is, about eight inches across. It grew on the north-side of a fir plantation, in boggy ground, never receiving a ray of sun; in this dismal swamp, its companions were *Lycoperdon saccatum*, from which in decay oozes the offensive olive-coloured pulp which contains the spores, and another slimy, but handsome Boletus, the *Flavidus*. It was not then, of old, a mere poetic association of ideas, that placed disagreeable productions in disagreeable situations,

surrounding deeds of darkness with objects, innocent, perhaps, in themselves, but such as haunt obscure seclusion, like bats and owls. No violet or primrose could have flourished, tempting the roving foot, in the spot where these Funguses were found; springing among dank sour weeds and fed by impure air and corrupted vegetable matter, of course they were unfit for food. Yet they were treasures to the botanist, and it is matter of regret, that by draining and burning the soil of this pet nook, the proprietor has effectually removed all traces of our present subject, and flourishing carrots reward his enterprise, in cultivating what appeared hopelessly unprofitable soil.



PLATE XXVI.

LYCOPERDON GIGANTEUM, *Batsch.*

Giant Puff-ball.

Gen. Char. Peridium membranaceous, with an adnate sub-persistent bark, within furnished at the base with a spongy sterile stratum. Capillitium unequal.

Spec. Char. LYCOPERDON GIGANTEUM. Peridium, above very obtuse, brittle, bursting in areolæ, at length broadly open; outer membrane sub-distinct. Spores olive-coloured.

LYCOPERDON giganteum, *Batsch, Berkeley, Fries, Persoon.*

BOVISTA gigantea, *Nees, Greville.*

Hab. In pastures and plantations.

There can be no difficulty in recognizing the Giant Puff-ball, mere dimension serving to distinguish it sufficiently; the size very frequently exceeds the specimens given in the plate, a note being made of some in August, 1846, one of which, extremely irregular from having been impeded in growth, squeezed up among felled timber, was equal in mass to a half-peck loaf. The Greeks called this Fungus *κρανίον*, and how correctly the name applies, the skull-like portrait proves; indeed, it appears necessary to state that it is an exact portrait, not humoured in the least into a fancied resemblance, the place where the root is broken off represents the nasal orifice.

However varied the forms of *Lycoperdon giganteum* may be, owing to checked expansion, &c., they will be found in youth to consist of a bag, gathered in at the base, and terminating in a single root. On peeling off the leather-like covering, which precisely resembles fine kid, and bears the impression of the finger, a soft snow-white mass is found to occupy the whole interior, growing denser towards the base; in age the upper part turns yellow, then olive, and shows itself to be the capillitium³, as it is called, among which the spores are placed; the lower part undergoes no change, being the sterile stratum.

The ripening of the spores causes the fertile plant to swell, so that when the Fungus has fair scope, it assumes more or less the shape of a reversed pyramid; further expansion cracks the upper part of the bag into tolerably regular polygons, and eventually the whole summit becomes opened for the dispersion of the dust-like spores. Of many, carefully watched, the progress has been simply this—on no occasion have the

¹ From *γαστήρ*, the *stomach*, and *μύκης*, a *fungus*; hymenium included in the receptacle.

² From *θρίξ*, a *hair*, and *γαστήρ*, the *stomach*; receptacle filled with floccose hairs on which the spores are placed.

³ From *capillus*, a *hair*.

contents of the peridium flowed out in a liquid form¹, still, individual observation can only be cited for what it is worth, and in rainy weather the bottom of the bag, by retaining wet, may reduce the contents to mud, in which case the peziza-like stratum might endure after the liquid was gone; whereas when deliquescence does not take place the whole mass remains together, shrunk in volume and greatly diminished in weight, fit for tinder or amadou. In these days, when a Lucifer match is so readily at hand, tinder has gone out of fashion for household purposes, but in the time of Gerarde, the dry Fusse-ball, which smoulders without flame, and is therefore not extinguishable by currents of air, was found a useful article in domestic economy. "In divers parts of England, where people dwell farre from neighbours, they carry them kindled with fire, which lasteth long; whereupon they were called Lucernarum Fungi." Their substance is in fact a natural amadou, such as is a necessary adjunct to the cigar, but if there be any truth in the opinion of the deleterious properties of the dust (spores), it would not be safe either to blow upon as tinder, or applied to wounds as a styptic; the belief that the "snuff" from the "Devil's box" is injurious to the eyes is general, whether well founded or not few would hazard the experiment of proving, any kind of dust in the eyes being unpleasant to say the least.

"The country people do use to kill or smother Bees with these Fusse-balls, being set on fire, for the which purpose it fitly serveth." (Gerarde's Herbal, 1597.) The "Humane Bee-keepers" are probably not aware that the use of this Fungus to assist them in "depriving" bees, is three hundred years old; a friend having lately asked for some to apply for the purpose, renders it impossible to refrain from saying a few words on this subject, questions of humanity being always worthy of investigation, and apt to be perverted by mistaken sentimentality. The country people of the present time "stifle" the bees irrecoverably when they take away their honey; the "humane" and enlightened bee-keeper, instead of depriving the bees of life for ever, "temporarily stifles" them so that they may recover, and then glories in his humanity over the rustic brute who massacres bees—"We have each got the honey, but my bees are alive!" Alive for what? To discover that the treasure they worked for is gone, the food they hoarded replaced by an inferior substitute, in order that they may toil through other summers to meet an equally bitter disappointment, living in the accumulation of wealth which they are never to enjoy,—but, "annually deprived", die annually. Surely *one* death were better, and no after-suffering of destitution; for the instinct which makes these insects hoard a sufficiency, must also inform them they have lost it. Poor bees! It would be well if it could be ascertained whether the "stifling" from one material be more painful than from another; it is permitted to kill an ox for food, by parity of reasoning it is therefore permitted to kill bees, only let both be done with as little suffering as possible; all life *must be once extinguished*, and, perhaps, the human bed of sickness is the most painful manner of all.

Under the head of *Lycoperdon saccatum* will be found directions for cooking the Puff-ball tribe; we need only add a repeated recommendation of the "Vescie buone da friggere" of the Tuscans—our Giant Lycoperdons.

¹ In *Lycoperdon saccatum* the deliquescence of the contents of the peridium oozes out as a disagreeable olivaceous fluid, but the *top of the bag does not burst in areolæ*, it decays altogether leaving the stem-like base entire.



Keene, lith. et imp.

F. R. del.

Tremella mesenterica, Retz.

PLATE XXVII.

TREMELLA MESENERICA, Retz.

Orange Tremella.

Gen. Char. Receptacle various in form, of a more or less gelatinous substance, homogeneous, the hymenium extended over every part of the external surface.

Spec. Char. TREMELLA MESENERICA. Rather tough, twisted, lobed, and plicate; orange-yellow.
 TREMELLA mesenterica, Retz., Fries, Berk., With., Grev., Bull.
Hab. On decaying branches, sticks, &c., common.

Translucent and jelly-like, this pretty Tremella has yet a firm texture, and does not melt between the fingers, nor smear them, as from its apparent viscosity a stranger to it might suppose would be the case; it is, in fact, gelatinous matter enclosed in a bag, variously puckered and drawn in; the fruit-bearing membrane being external, and carried down into all the crannies and plaits of the tremulous mass which sustains it. It forms minute pallid sacs beneath the bark of stakes, &c., and might at first be taken for the juices of the wood inspissated on oozing out; these small bodies are produced in lines, running along some particular fissure of the woody fibre, pushing off its cuticle, and then freely expanding into the elegant Orange Tremella; one or two only, of what may be considered perfect plants, having taken the lead, keep it, but a row of immature ones may generally be found following in their train, if we strip off the loose bark which screens them.

Let us examine this espalier stake; the fulness of creative energy cannot be better exemplified. We will reckon how many species of flourishing existence replace the life of the sapling oak, for such it was, cut from the coppice. Firstly, then, our showy Orange Tremella, which instantly strikes the eye, occupies more than one position, the bark of the wood being rolled back to give it place. Secondly, lower down the beautifully banded velvety tiles of *Thelephora versicolor* occupy a place. "I see nothing else—O yes! here, coming through the earth, are some black stags'-horn-like substances, with snowy tips, very pretty, but are they a Fungus?" They are,—*Sphæria Hypoxylon*, a peculiar and easily recognized plant. "But they do not belong to the stake." Pull it up; you see they grow from it, a short distance below the surface of the soil, and now that the wood is nearer to the eye it will discover something more, for that prevalent grey hue of the bark, is a close crust of minute circular discs filled with a brown-yellow substance, like tiny cheese-cakes; these are the shields containing the fructification of *Lecanora subfusca*, one of the extensive Lichen family. Here are small black bodies, looking like the dung of some little insect, but in reality another kind of Lichen, *Lecidea elaeochroma*. The black patches which replace the cuticle of the wood here and there,

as if it had been burned, are a congeries of a most beautiful microscopic object, *Sphæria stigma*; and these bits of buff velvet are *Thelephora incarnata*. So that not a space upon the bark of our perishing Oakling but is occupied by the parasitic life it nourishes, while the very cuticle itself, though loaded superficially with Lichens, is broken up and pushed off by various eruptive *Sphærias*, which have their origin deeper; here is *Sphæria taleola* doubtless, lying perdue beneath these little crater-like orifices; remove the outer pellicle of bark carefully, there, those black spots with white centres are the Fungus in question.

All these subjects are well worthy microscopic investigation, and although it has been determined that the present work shall embrace only such Funguses as do not necessarily render the use of one indispensable, still an incidental allusion to minuter objects, as exquisite in their finish and developement as the most gigantic, cannot be misplaced. It is not to be supposed that all these genera are present on all sticks, but so great is the number of species frequently to be discriminated, that we assure the student the particular specimen of wood now lying on the desk, not only exhibits the various Funguses and Lichens indicated, but some Mosses to boot!



F. R. del.

Reeve, lith. et imp.

Dædalia betulina *Persoon*

PLATE XXVIII.

DÆDALIA BETULINA, *Linn.**Birch tree Dædalia.*

Gen. Char. Hymenium consisting of anastomosing gill-like processes, composing elongated flexuous contorted pores; formed out of the corky substance of the pileus, or concrete with it. Name from Dædalus, in allusion to the labyrinthiform disposition of the hymenium.

Spec. Char. DÆDALIA BETULINA. Pileus sessile, from two to four inches broad, corky-coriaceous, dimidiate, zoned, tomentose or villous, deeply grooved concentrically, clothed with close coarse velvety down, greyish, pallid, often green from the growth of minute parasitic algæ. Gills nearly straight, slightly branched or anastomosing, pale or tan coloured.

DÆDALIA betulina, *Berkeley*.

AGARICUS betulinus, *Linnaeus*, *Sowerby*.

LENZITES betulina, *Fries*.

Hab. On decaying wood, posts, &c., principally birch; perennial.

Dædalias were formerly classed with *Agarics*, and in general configuration the present subject is Agariciform, which made Fries place it apart, along with a few others in the class *Lenzites*, intermediate between *Agaricus* and *Polyporus*. It is because in *Lenzites* there are no marginal pores, and the divisions radiate gill-like from the base, that Fries expelled that class from under the great head *Polyporei*; as however their other botanical characteristics (the plates which form the hymenium being concrete, or of the same substance with the pileus,) prevented their being placed among the *Agaricini*, they were in the case of the notorious bat; and our authorities are content to form one division of all the corky-coriaceous labyrinthine species, and to call them *Dædalia*.

A *Dædalia* then is a corky-coriaceous, generally dimidiate and sessile, but sometimes resupinate, and sometimes confluent stemmed fungus, resembling a *Polyporus* in general growth and appearance, but instead of the under surface remaining pored, it assumes a labyrinthine configuration; however it may alter in the course of expansion, or the processes become lengthened with age, they never make pipes terminating in a plane of circular orifices for an under-surface, as a *Polyporus* does, but irregular involved cavities like a maze, the complicated wards of a key, or sinuous elongated cells with their dissepiments resembling clumsy gills, as in our present subject *D. betulina*. Whatever the configuration of the sinuses may be, the hymenium lines them, and the spores may be found on a piece of glass, deposited as they are from an Agaric. The handsomest of the English *Dædalias* is *Quercina* (which we shall present to notice hereafter), and it exemplifies the character of the class much better than *D. betulina* does. Others are very complicated and elegant

in their involved patterns and minute development. *D. biennis* grows on the ground from the buried roots of trees, not upon the timber, and is sometimes very handsome with a number of pileated fronds, and confluent stems; at others a shapeless irregular mass, involving twigs and blades of grass in its effused mass. *D. unicolor* grows on stakes &c., as *Polyporus versicolor* does, and in extreme youth may be taken for it; but the adult *Dædalia* has small, flexuous, maze-like divisions beneath, having lost the distinct pores, like pin-holes, which the *Polyporus* always retains near the margins, how ragged and jagged soever age and insect devastations may have rendered the central portions.

None of the small *Dædalias* are of any use that we are aware of, and probably possess no active qualities. *D. unicolor* on being broken across in the middle of December, invariably contained two or three maggots, as large as plump grains of wheat, in each pileus, not of greater dimensions than a shilling; under the convex velvet tile, they had a safe and warm winter roof, but not much spare room. It is very difficult to get a section of *D. unicolor*, not injured by the gnawing of these larvæ.



PHILADELPHIA, 1840

TO THE EDITOR OF THE PHILADELPHIA GAZETTE

SIR, I have the honor to acknowledge the receipt of your letter of the 10th inst. in relation to the publication of the report of the Committee on the subject of the proposed amendment to the Constitution of the United States, and in reply to inform you that the same has been forwarded to the proper authorities for their consideration.

I am, Sir, very respectfully,
Your obedient servant,
J. M. Smith

I have the honor to acknowledge the receipt of your letter of the 10th inst. in relation to the publication of the report of the Committee on the subject of the proposed amendment to the Constitution of the United States, and in reply to inform you that the same has been forwarded to the proper authorities for their consideration.

PLATE XXIX.

POLYPORUS HISPIDUS, *Bulliard*.*Hispid Polyporus*.

Gen. Char. Hymenium concrete with the substance of the pileus, consisting of sub-rotund pores with thin simple dissepiments. Name from *πολὺς*, *many* and *πόρος*, a *pore*, in allusion to the many pores of the Hymenium.

Spec. Char. P. HISPIDUS. Pileus a foot or more across, about four inches thick, pulvinate, dimidiate, but occasionally with an obsolete knob-like stem, often imbricated, forming very large masses. The upper surface generally shaggy or hispid, but sometimes almost smooth and cracking. Colour varying from yellow to rich red, brown, or black. Pores very minute, at first pallid, then yellow, fringed. Substance fleshy, but spongy, elastic, and fibrous, red, yellow, or brown-red. Tubes an inch long at their greatest depth, the same colour as the flesh. Spores yellow.

POLYPORUS hispidus, *Fries*, *Greville*, *Berkeley*.

BOLETUS hispidus, *Bulliard*, *Bolton*, *Withering*.

———— velutinus, *Sowerby*, *Withering*.

———— spongiosus, *Lightfoot*, *Withering*.

———— villosus, *Hudson*, *Withering*.

Hab. On trunks of various trees, Apple, Ash, Elm, &c.; summer and winter. Annual.

Few *Polyporuses* of the larger kinds differ more from each other than *P. hispidus* does from itself, according to the position it occupies on the trunk, the species of tree producing it, and its stages of growth. Withering has given three graphic descriptions of it, as *B. hispidus*, *B. spongiosus*, and *B. velutinus*, characteristics of various specimens falling under his observation, and which he suggested might prove to be the same Fungus, as it is now decided they are. The portrait before us was taken at Avington, Hants, in August, 1846. The original grew deep in the cavity of an Ash tree, and possessed all the luxuriance and brilliancy of youth, in which state none of its relatives surpass it in beauty. Only a portion of an immense mass is depicted; “it was so juicy and tender, turning dark-brown at the slightest touch, that it was most difficult to preserve any of it to paint.” “The upper surface was most beautiful, rich tawny orange-plush with velvet margins. The tubes are in the centre, nearly an inch deep, and their orifices consist, as it were, of a film of white velvet, which is only superficial, the tubes themselves being red like the substance of the pileus, which almost resembles raw meat, dotted with the yellow contents of the tubes.”

During the same season a splendid mass of our poor friend, served for some days as a foot-ball in the meadow where it grew, to a family of young people; and this trivial anecdote is mentioned, as exemplifying the texture of the pileus, light, elastic, spongy, but not easily ruptured, nor giving out its juices so as to soil,

although the quantity of liquid contained in the substance might be expected to flow out, as it does from that of *Polyporus sulphureus* or *Fistulina hepatica*. In age it is much more dense, but still fibrous. A representation of it in this state shall be shortly given, since otherwise the student may be greatly perplexed in determining varying specimens of a *Polyporus*, sure to attract attention, as much as its beauty deserves it. Our present subject is *Boletus velutinus* of Sowerby, who thus describes it: "This *Boletus* has a pileus in its early state so very like velvet, that the name could not be more apt; when more advanced, it almost deserves the term hispid, as it resembles plush; afterwards it becomes black and rots; the pores being at first of a whitish or light yellow-colour and short; they grow longer and browner till they emit a yellow powder, which is more easily seen, when its weight causes the threads of the spiders, which have run over the pores, to hang down in festoons like *B. hepaticus*. The edges of the pores are sometimes perceptibly fringed. This Fungus grows most commonly on Apple trees, and sometimes to a very large size." The *Boletus spongiosus* of Lightfoot and Woodward, cited by Withering under the head "tubes white," is our youthful *Polyporus hispidus*, before the mouths of the tubes have opened to emit the yellow spores, which colour them at a later date. This is stated to be "very elegant when young, turning quite black when old; and on Elms, frequently to be seen as large as a peck measure, or to exceed the trunk of the tree in diameter."

As *Boletus hispidus* of Bolton, Withering also places it among the "red-tubed" species. In age this is not an incorrect statement, but it shows that the colour of the *tubes* is useless as a botanical distinction, particularly when, as is often the case, the orifices of the said tubes are of a different colour from the piped part itself. We have had the *white* state of the pored hymenium, and the old dusky *red* state alluded to in the above synonymes of *P. hispidus*. In the *yellow* state, which is the perfection of the plant, Withering describes it with his usual felicity, under the head *B. velutinus*. "Tubes bright gold-colour, changing to a brown-yellow, half an inch long. Pores irregular in size, angular, light greyish-brown, apparently woolly, largest towards the end of the pileus and oblong. Pileus a very large mis-shapen mass, covered with a stiff plushy pile consisting of upright hairs, a quarter of an inch high. Colour silvery grey or greenish, changing to brown-orange, and at length black. Sometimes twelve inches by seven and tiled one over the other; the surface rather like a sponge, porous and cavernous; the colour varying from grey to green, from red-brown to orange-brown. Flesh several inches thick, chocolate-coloured with a rich red tinge, juicy. In the younger state of the plant, the pile on the pileus consists of all colours from pale yellow to deep brown-orange, and when magnified appears composed of stars radiating from a centre. It is very beautiful seen through an eye-glass, but its beauty is soon destroyed on account of its tender juicy state. Flesh, tough, fibrous, brown-yellow. On trees at Edgebaston. On the trunk of a fallen Oak, which had been stripped of its bark about three years before, near Beoley in Worcestershire."



Agaricus campestris, L.

PLATE XXX.

AGARICUS CINNAMOMEUS, *Linn.**Cinnamon-flavoured Agaric.*Series CORTINARIA.¹Sub-genus DERMOCYBE.²

Gen. Char. DERMOCYBE. Veil dry, arachnoid, very fugacious. Stem not truly bulbous, fibrillose, stuffed when young. Pileus clothed with fibrillæ, rarely with gluten. Gills unequal, rather broad, close.

Spec. Char. A. CINNAMOMEUS. Pileus rich cinnamon-colour, two or three inches broad, slightly fleshy, silky, fibrillose, convex when young, then obtusely umbonate, nearly plane, but the margins always slightly incurved, thin and often splitting. Gills adnate, close, unequal, broad, ventricose, argillaceous cinnamon-colour when young, then ferruginous from the spores. Stem from two to three inches high, slender, equal, flexuous, stuffed, (in age hollow,) fibrillose, yellowish-cinnamon, the base rufous (never white). Flesh compact, yellowish, smell pleasant, flavour aromatic like cinnamon. Esculent.

AGARICUS cinnamomeus, *Linnaeus, Withering, Greville, Berkeley, Fries, Persoon.*

Hab. Plantations and heathy woods; rare in the South of England; under Firs in peat soil, Keston, Kent. End of summer and autumn.

Agaricus cinnamomeus does not owe its distinctive appellation to its colour alone, otherwise the handsome *A. aimatochelis* might have contested the title with it. Indeed the colour of the latter more closely resembles the spice, than does that of the true *A. cinnamomeus*, which has a tinge of deep yellow pervading it, the expressed juice being of that hue; and it will not require a very large organ of colour to see, that canella, or cinnamon, has no yellow whatever entering into its composition. A variety is mentioned by Fries having sanguine gills, and Withering calls them "deep tawny-red;" so that the Agaric Mr. Stackhouse described and which he found in Cornwall, appears to have been this "semi-sanguineous." In Scotland, according to Dr. Greville, *A. cinnamomeus* is frequent; we found it once only at Keston, and those specimens accorded exactly with Dr. Greville's description of the northern Fungus, and with that of Krombholz, not being so red as Withering states. Krombholz's term "argillaceous cinnamon" describes the hue of the young gills very exactly, but when stained by the red-ochraceous spores, they are darker. The peculiar smell and flavour of cinnamon possessed by this Agaric in a fresh state, (we are not aware whether it retains it when dried,) is so powerful, and so exactly like that of the spice, that it appears extraordinary it has not been generally

¹ From *Cortina*, a veil; spores reddish-ochre. Veil arachnoid.

² From δέρμα, *skin* or *membrane*, and κύβη, a *head*.

remarked by the authors who notice the Fungus. No other Agaric possesses a similar odour or taste, therefore it is impossible to mistake it when found. According to Fries, *Agaricus cinnamomeus* grows in woods *everywhere* most copiously, but unfortunately for those in the South, who may wish to taste the "dainty dish," his *everywhere* means the polar side of 55° North Latitude. We do not intend to assert that it never crosses this line, but sparingly, very seldom, and only in favoured cool spots where moisture of soil prevails, as well as umbrageous shelter. It is collected in the Bohemian forests from July to October, particularly in low, damp situations, where it invariably flourishes. It is gregarious in habit.

"The pleasant smell and savoury flavour" (in the opinion of our German friends) "render it a great favourite in cookery; it is generally stewed in butter, and is also served with sauce for vegetables." We do not mean to sneer at the tastes of our continental authorities, but an English palate cannot be easily reconciled to mixtures so strange to it. A poor English school-boy was complaining of Dutch cookery, without receiving much attention, as anything very *recherché* in the style of a school cuisine is seldom expected; at last he did extort some pity: "But indeed, Mama, they send up the cauliflowers in cinnamon sauce!" If then any of our friends should find this excellent Agaric, we recommend that it should be cooked very nicely in white sauce, but not that the cauliflowers should be sub-merged in the delicacy. *Agaricus cinnamomeus* is not included among the esculent Italian mushrooms by Vittadini, or the French ones by Persoon; probably neither author had met with it. It has not recurred in the spot where it grew at Keston some years ago, and therefore, although Mrs. Hussey does not in the least question its good qualities, she thinks it better to disclaim being any authority for its use, not having had an opportunity of trying the experiment upon herself, as in promise and duty bound to do.



F.R. del.

Polyporus hispidus, Bull. var.

Reeve, Benham & Reeve, imp.

PLATE XXXI.

POLYPORUS HISPIDUS, *Bulliard*.*Hispid Polyporus*.

Gen. Char. Hymenium concrete with the substance of the pileus, consisting of sub-rotund pores with thin simple dissepiments. Name from *πολὺς*, *many* and *πόρος*, a *pore*, in allusion to the many pores of the Hymenium.

Spec. Char. P. HISPIDUS. Pileus a foot or more across, about four inches thick, pulvinate, dimidiate, but occasionally with an obsolete knob-like stem, often imbricated, forming very large masses. The upper surface generally shaggy or hispid, but sometimes almost smooth and cracking. Colour varying from yellow to rich red, brown, or black. Pores very minute, at first pallid, then yellow, fringed. Substance fleshy, but spongy, elastic and fibrous, red, yellow, or brown-red. Tubes, at their greatest depth, an inch long, the same colour as the flesh. Spores yellow.

POLYPORUS hispidus, *Fries, Berkeley, Greville*.

BOLETUS hispidus, *Bulliard, Bolton, Withering*.

———— velutinus, *Sowerby, Withering*.

———— villosus, *Hudson, Withering*.

———— spongiosus, *Lightfoot, Withering*.

Hab. On trunks of various trees, Apple, Ash, Elm, &c.; summer and autumn. Annual.

The accompanying plate represents *Polyporus hispidus* in an aged state, being *Boletus spongiosus* of Lightfoot and Woodward, “very elegant when young, turning quite black when old,” when it is scarcely recognizable for the same fungus, which decked in orange and crimson plush or velvet, soft, elastic, and losing its delicate hues and texture with the slightest touch, suggested one of the gayest drawings in our Mycological Portfolio. In the state now depicted we also see *Boletus hispidus* of Bolton, given by Withering in his section “tubes red,” the yellow spores having been long shed, and the delicate fringes of the pores obliterated. Hardened and consolidated by age, the substance is tough and fibrous, (not smooth and corky,) when divided, and shrinks into much smaller dimensions than it possessed in the youthful state. This elderly example grew high upon an Ash, and enclosed the Ivy in its increasing volume; but so easy and gentle is the manner in which this is performed, that leaves and tender shoots are scarcely displaced, but remain green and flourishing, when we should have expected to find them suffocated in a deadly embrace. Many of the *Polyporus* tribe have this habit as well as *P. hispidus*, so that it is not in any way distinctive. The Ash according to our experience is the favourite habitat or nurse of the Fungus; where a limb has decayed in an otherwise flourishing tree, it may be found growing, generally at some feet from the earth, often as much as twenty or thirty. It is from the inspection of specimens differing so much in condition,

as to lose their superficial resemblance to each other, that an opinion prevails of the great uncertainty and sportiveness of Fungus growths. It is quite true those in question differ, and the notices of them differ still more; but let a Sun-flower be described in full blossom, with its glory of yellow petals, and centre of florets sparkling with pollen; then a month after when all this is gone; and again in winter when the honey-comb of cells remains empty of seeds. These states are no sportive disease or change in the plant: nothing but a smile would greet the observer who fancied these three Sun-flower heads were not the same thing; that a Sun-flower sometimes made a change in its economy by producing seeded heads, at others empty-celled ones, instead of the sun-like disc from which it gained its name.

Polyporus hispidus is so handsome, that its being of no known utility may be excused, even by the utilitarians. Every object in Nature, however, which by its attractiveness of colouring, remarkable configuration, or other striking peculiarity, induces us to study Nature's works, is useful. *That* is an end for its existence, were there no other, and perhaps there is none: *that suffices*. The languid duty walk; the apathy towards plants and simple objects in the path; the dulness of the country without society; the weariness of mind which only brightens at the excitement of romances: all who, possessing themselves healthy minds, pity (for they are miserable objects of pity) those who suffer under this mental and moral sickness, will by their influence attempt to spread a taste for studies which must act as the surest "medicinal balm." Children always take a strong interest in the pursuits of their seniors; and should early be taught the valuable lesson contained in "Eyes and no Eyes." In whatever district they may reside, some external pursuit, or object will present itself, and habits of observation, and amusing tastes may be formed, useful through life for the same end. But if Mama object to the little fingers which present her a Fungus, that it has soiled the glove, or forget the Fossil because chalk pits make jackets dusty; if servants are allowed to walk with the children strictly in hand, and to scold at stepping across a ditch for the flower: Mama must not in reason complain if the "Young Lady" be as vapid as the description we have given above; and, in after years, unamusable, delicate, repining, and should cause constant uneasiness and anxiety, instead of finding occupation and a charm in everything; "The life of the house."



F. R. del.

Reeve, Benham & Reeve, lith

Bulgaria inquinans, Persoon.

PLATE XXXII.

BULGARIA INQUINANS, *Persoon*.*Pitch-black Bulgaria.*

Gen. Char. Cup at first closed; Asci immersed, at length free and bursting forth. Gelatinous; name from *Bulga*, a leathern bag.

Spec. Char. BULGARIA INQUINANS. Top shaped, firm, tough, elastic, gelatinous, dark brown or chocolate; externally rough, rugulose, furfuraceous umber; disc nearly plane, sometimes lacunose, smooth and shining, pitch-black; stem in general blunt, almost obsolete, sometimes fasciculate and confluent.

BULGARIA inquinans, *Fries, Berkeley*.

PEZIZA inquinans, *Persoon*.

——— nigra, *Bulliard*.

——— polymorpha, *Withering, Sowerby*.

Hab. On Pollards and felled trees. Autumn and winter.

There are only two of this family known in England, *Bulgaria inquinans* and *Bulgaria sarcoides*: the latter cannot be mistaken for its relative; but a totally different Fungus, *Tremella fimbriata*, has been so by cursory observers, therefore it appears necessary to point out the distinction between them, as they are members of very distinct natural tribes, the *Cupulati* and the *Tremellini*. *Bulgaria* is a division of the *Cupulati*, having the reproductive bodies situated in their concavity, which is more or less closed when young; in the *Tremellini* there is no concavity, except such as may be artificially formed by the folds and wrinkles of the mass, upon the external surface of which the spores are placed. *Bulgaria* is a top-shaped cup, filled with dense jelly in which the spores are immersed; *Tremella fimbriata* is not a cup at all; it was for some time doubtful whether it was a British Fungus, but that is placed now beyond all question. It abounded at Hayes, in the winter of 1846–7, on oak-pollards felled the previous season, but not denuded of their bark. When moist it is gelatinous and elastic; when dry, extremely brittle, corrugated and gathered in plaits to one point, and this point is inserted stem fashion, (but is not a true stem,) into the fissures from which it springs. Whole lines of it filled up the deep channels cracked in the bark. When dry, under the microscope it resembles a shining brilliant lump of coke; it gives a tint to water like pale sherry. *Bulgaria inquinans* likewise tinges water in the same manner, and melted down is a good substitute for Indian Ink or Sepia, working very pleasantly, and as if gum were mixed in common water-colour; run down in this manner the substance is elastic and might be taken for Indian rubber, but is not so tough; it has no unpleasant taste or smell, and possibly may be nutritious, but of this we know nothing. *Exidia glandulosa*, another Fungus with which our *Bulgaria* when emptied of its contents may be confounded, belongs to the *Tremellini*.

The external coat of *Bulgaria inquinans* is brown not black, and slightly branny and rough ; if not a beautiful Fungus, there is nothing repulsive about it, and as our object is to display, as far as our means will allow, the great variety of Nature's works in this neglected field, Mycology, it may often happen that in carrying out the design, the showy and attractive will be obliged to stand aside for a little time, till the unobtrusive have had attention bestowed on them.

The *Bulgaria* we are now considering, grows out from beneath the bark, taking its origin between that and the wood, and finding its way to the surface, where the natural fissures give it an easier task. Mr. Berkeley states that it is "not uncommon," but at Hayes we have only twice found it, both times on felled wood, from which it had pushed the decaying bark by its increase in volume. Very wet weather evidently favours its development, by swelling the tough elastic substance of the Fungus, as well as softening and loosening the fibres of the bark. It appears late in autumn and endures through the winter, shrinking into very small dimensions during frost, and expanding again under the influence of warm showers. In spring the empty cups may be seen, split, rolled back, divested of their contents, and of so much of their character, that they may considerably perplex the student ; it is always pleasant to "make out" an object, to "solve a puzzle," and "conquer a difficulty ;" a determination to do these things is right in students of all branches of knowledge, otherwise we must candidly avow, and the most bigoted Mycologist should admit, that error in this particular case is of no consequence to the general welfare of mankind.



F. R. del.

Reeve. Benham & Reeve. lith.

Polyporus squamosus, Hudson

PLATE XXXIII.

POLYPORUS SQUAMOSUS, *Hudson*.*Scaly Polyporus.*

Gen. Char. Hymenium concrete with the substance of the pileus, consisting of sub-rotund pores with thin simple dissepiments. Name from *πολύς*, *many*, and *πόρος*, a *pore*, in allusion to the many pores of the Hymenium.

Spec. Char. POLYPORUS SQUAMOSUS. Solitary or imbricated; from a scaly blackish knob arise one or more stems; when full grown, pileus broad, pale ochre with scattered brown adpressed scales; stem blunt, sub-lateral, pores pale, large, angular, very irregular towards the stem. - Smell powerful; spores white.

POLYPORUS squamosus, *Fries, Berkeley, Greville.*

BOLETUS squamosus, *Hudson, Withering, Sowerby.*

———— polymorphus, *Bulliard.*

Hab. On decaying timber, principally Ash. Summer and early autumn; sometimes forming immense masses. Annual.

In a quarto plate it is impossible to give an adequate representation of the gigantic growths classed under the general head *Polyporus*; and this is one of that number; there are few persons, however, who will not immediately recognize an old acquaintance in our specimen. Although very common, and to the botanist, therefore, an object of small interest, it is brought forward to show to the uninitiated the various styles of developement these Funguses present. Except in as far as the size of the masses they form is concerned, there is little in common to the external appearance of *P. squamosus*, *P. dryadeus*, and *P. hispidus*. The substance of *P. squamosus* differs much from the two others, being less persistent, never woody, but often flaccid, or tough, leathery, and stringy; and the pores instead of being minute, as in those varieties, are large, angular, and jagged, like those of some of the soft fleshed *Boletuses*. Although tough and leathery, *P. squamosus* easily becomes the prey of insects; the growth of a beautiful mass, springing from a perfectly defunct pollard-ash, being watched carefully in 1846, on the 21st of July was in perfection, on the 31st riddled in every direction by larvæ and decaying fast; of course the destruction would not have been so rapidly effected at a later period of the season, when insects are not so active, but at all periods this Fungus is a favourite resort for them.

Strange things have been eaten by the truly hungry, stewed saddle-flaps, perhaps, in a besieged city, and to these we suspect *P. squamosus* has a strong resemblance; the statement of Mons. Roques is so decided as to its being used as food in France, that an inveterate devourer of Funguses, full of faith, insisted on trying the experiment, but mastication was out of the question, and the flavour by no means tempting. On cutting across the stems of a growing mass, a considerable quantity of very viscid sweetish liquid flowed out, the

sap of the poor old Ash Pollard, apparently not much modified, but it was not subjected to strict chemical analysis; it could not be turned to any use we could discover. When boiled down it resembled bad treacle, but possessed none of the qualities or flavour of ketchup.

The stems when properly prepared, furnish razor strops; to this end it is necessary that the substance should be fully ripe, otherwise it is too succulent and shrinks; pieces free from insect holes should be selected, and slowly dried beneath heavy pressure; afterwards they may be pared down to a plane surface, proper for use. We have a piece gathered by a friend forty years ago, and used as an admirable sharpener of pen-knives ever since; it is not corky in texture, not being so elastic or impressionable; but approaches more nearly to the best sole-leather.

With regard to the dimensions acquired by *P. squamosus*, in the lane between Hayes and Addington, in 1846, twenty-five pounds of fresh flourishing lobes were taken from one old Ash stump, and even larger remains of a previous season's growth were visible. In Hooker's *Flora Scotica* mention is made of a mass which acquired the weight of thirty-four pounds in three weeks, and measured seven feet five inches in circumference; the more usual mode, however, in which it extends is in length, imbricated upwards and downwards, and it appears on the same tree for several successive seasons. Monstrous specimens of this *Polyporus*, prevented from taking their natural expansion into a true pileus, and therefore acquiring a cristate or palmate shape, (as is the case with *P. sulphureus*) have been erroneously considered as distinct species, and variously named accordingly. *B. Rangiferinus* is one of these, and several other examples occur in the old authors. The peculiar odour of our present *Polyporus* is not easily described: Withering calls it a "rank Fungous smell." The scent serves to distinguish it decidedly from any other, and no one considers it agreeable. "Pileus pale buff, with feather-like scales of a deeper dye, sometimes with a tinge of red, semi-circular, or fan-shaped, from five to fourteen inches over. Flesh white, firm, elastic. Stem lateral, dark-coloured, white within, from one to two inches long and as much in breadth." To these particulars it only now remains to add, that a greenish hue is given to old plants by minute Algæ, and one pileus lying over another frequently deposits upon it a white bloom or dust which is the ejected spores.



PLATE XXXIV.

BOLETUS BOVINUS, *Linn.**Cow Boletus.*

Gen. Char. Hymenium distinct from the substance of the pileus, consisting of distinct separable tubes. Name from βῶλος, a *ball*, from the rounded form of many of them.

Spec. Char. B. BOVINUS. Gregarious, sometimes two or three fasciculate. Pileus from two to four inches broad; at first hemispherical, then expanded, rather pulvinate, but the margins incurved; reddish-buff or the colour of a half burned brick (*gilvus*), viscid flesh from one to one and a half inch thick, tender, soft, varying from nearly white to pale yellow, darker beneath the epidermis, not turning blue, but acquiring a slight vinous tinge. Tubes sub-decurrent, compound, large, angular, shallow, not easily separating from the flesh of the pileus, grey-yellow then ferruginous; spores pale. Stem from two to four inches high, from half to three quarters of an inch thick in the middle, for the most part equal, but in young specimens sometimes bulbous at the base, thickening above and diffusing itself into the pileus, smooth, elastic, firm, ribbed, of a paler shade than the cap. Taste and smell, sweetish, agreeable. Esculent.

BOLETUS bovinus, *Linnaeus, Fries, Berkeley, Greville.*

——— gregarius, *Flora Danica, Withering.*

Hab. In heathy pine woods; summer and autumn. Rare in the South of England.

Krombholz, who has given a very minute description of this Boletus, says that it is sought for as a dish, and is good dried; we have not found it plentiful enough in Kent to spare any for the table, but no other cause would make us hesitate to eat what is so decidedly recommended by good authority. The internal evidence is completely in its favour, both taste and consistency being very agreeable, and the flesh does not assume that blue tinge on being broken or cut, which, whether with reason or not, prepossesses against the individual subject to the change. External recommendations we cannot say it possesses, nor do we consider it an “elegant species” except on paper; the sticky nature of the epidermis causing grains of earth, dead fir-needles, and pieces of grass, ruptured by its pushing upwards, to adhere to it, in a Tom o’ Bedlam coronal, by no means adding a grace to its *attractive* pileus. In some of the Boletus family the coat of gluten covering the pileus is of a darker shade than the substance it lies upon, but in *Boletus bovinus* it is colourless, and this is one mark of distinction, besides others, between it and *B. granulatus* as well as *B. luteus*. They all belong to Fries’ class *Viscipelles*, and although their slimy coats may occasion prejudice, are excellent food, if gathered before the ravages of insects commence; to these they are very subject, and not unfrequently a fine perfect-looking specimen crushes to pieces at the touch, the very ghost of a Fungus, entirely without substance, though retaining the outward shew of one. The derivation of the name is not

quite clear; *B. granulatus* affords milk, which, drying in little grains, gives cause for that designation, and we might fairly enough suppose Linnæus considered that species as Vaccine, when he gave the Bovine title to its nearest of kin. But there is also a *Boletus vaccinus*, which yields no milk, but is chesnut or red-cow coloured, and it is alleged that our *Bovinus* is similarly named from its hue; the latter *Boletus* is not, however, of the dark red-brick shade we see in cattle, but what the German authorities style “gilvus,” the colour of a half-baked brick, reddish-buff, and when once known it cannot be better pictured to the mind than by that simple word. *Boletus pachypus*, already given, and *Agaricus aimatochelis* are examples of “gilvus.” This is a colour met with often enough among kine, particularly of the Guernsey breed, and is probably common in Sweden, but must not in the present case be confounded with the deep red-chalk hue of the Bovine glories of Herefordshire.

On cutting across *Boletus bovinus*, it will be found that the large irregular pores are each the orifice of several tubes running into one, or compound tubes; it is an excellent example of the structure; the flesh is pale yellow, and grows whiter by exposure to the air, acquiring also a vinous tinge. Krombholz, who notices these particulars, mentions also that “the base of the tubes turns bluish very seldom,” but this implies that it does change to that colour sometimes, a fact we have never verified. Casual observation might confound with it *B. piperatus*, which has also a coarsely-pored under-surface and nearly the same coloured pileus, but gold-yellow flesh, and a very biting taste, like capsicum.

In the clear northern climates, where these Funguses can attain perfection, without becoming the prey of such innumerable swarms of larvæ, they must be extremely valuable; they abound in pine forests, and are gregarious. In the sub-alpine part of Scotland, *Boletus bovinus* is common, according to Dr. Greville: indeed, it seems a very favourable site for all the tribe, although it is to be feared their good qualities are not appreciated there.



F. R. 32.

Agaricus xeruginosus, Curtis.

Reve. Bulletin 8. 1877. mp.

PLATE XXXV.

AGARICUS ÆRUGINOSUS, *Curtis*.*Verdigris Agaric.*Series PRATELLA.¹Sub-genus PSALIOTA.²

Spec. Char. A. ÆRUGINOSUS. Pileus one to four inches broad; yellowish, smeared with blue, more or less persistent, gluten which gives it a green tint; fleshy but thin, convex, expanded; when young sometimes covered above the gluten with pure white scales, the remains of the veil. Gills umber, or purplish-umber, plane or very slightly ventricose, adnate with a small tooth; margin white, pulverulent, or with the remains of the veil attached in fragments. Stem two or three inches high, from a quarter to half an inch thick; rooting by a few branched white fibres, straight or flexuous, sometimes sub-bulbous; at first scaly, scales reflexed, then more or less smooth with various tints of blue, green, or yellow; at first stuffed, then hollow; mottled with blue within, the centre white. Ring in general fugacious; smell rancid.

AGARICUS æruginosus, *Curtis, Fries, Berkeley, Greville, Sowerby, Withering.*

—— cyaneus, *Bolton, Withering.*

Hab. Among grass and sticks, near hay-stacks; in woods and fields; late summer and autumn, very common.

From the stout handsome Agaric of a bright verdigris tint, with pure white fragments of the veil in relief upon stem and pileus, to the slender, dull-straw-coloured, sticky, insignificant specimens (turned disdainfully out of the collector's basket, with "only that tiresome *Æruginosus* again!") the varieties are numerous. And why is the poor Fungus "tiresome?" Because, when Agarics are scarce and anxiously hunted for, it will present itself, not only in proper garb, but in all states of undress, seducing the unwary by resemblances to other Agarics, or to nothing seen before, holding out the hope of "novelty," a hope strong in the breast of every Mycologist. With its face washed clean by the rain, a small one puts on the yellowish face of *A. semi-globatus*; a large one, that of *A. præcox*; but while the blue veil continues to envelope it, our Agaric is a very distinct and characteristic species. The green hue is given by the intrinsically yellow pileus shewing through the blue gluten. In spite of the said gluten being a repulsive feature in itself, rendering the touch unpleasant, *A. æruginosus* is, when in full and fresh perfection, a very elegant and striking member of the Fungus family, particularly while the white fragments of the veil, and its debris

¹ From pratum, *pasture ground*. Veil not arachnoid. Gills changing colour, clouded, at length dissolving. Spores dark, brown-purple, or nearly black.

² From ψάλιον, a *ring* or *collar*. Veil forming a ring, sub-persistent, really partial. Stem firm, sub-equal, distinct from the pileus. Pileus more or less fleshy, convex, then campanulato-expanded, viscid or clothed with squamules or fibrillæ. Gills fixed or free, broad, becoming brown. In some species there are the rudiments of a universal veil.

attached to the stem, remain in purity ; they are very evanescent, the ring disappearing almost entirely, lost and deliquescing in the moisture. In age, not only the white fragments of the ring and veil have disappeared, but in general the slimy envelope also, remaining only in brownish films or fibrillæ, and the whole plant has become a dingy yellow, or is bleached to dirty white. The gills which at first are pallid, rather lilac in some cases, changing as the spores ripen, are eventually brown-purple. It must not be forgotten that this changeable nature of the gills is caused in most instances by the spores acquiring maturity, and also that the intrinsic colour of the spores themselves can only be ascertained by careful examination, when they have been deposited on some proper medium ; for if the gill have a colour of its own, it will deceive the judgment by shewing through the spores : for instance, the red-brown gill of the common Mushroom gives an effect to the hymenium, which is not the true shade of the spores ; they, when perfectly ripe, are not, as commonly described, *purple-brown*, but on the faith of an artist's eye (whose organ of colour has not been perverted), of a rich Vandyke-brown shade, not a particle of red or purple entering into its composition.

The tinge of verdigris would deter all adventurous cooks from trying the qualities of *Agaricus æruginosus*, it is so connected with poisoning copper utensils, that unlucky green ! besides, the smell like “rancid ointment,” gives an impression anything but provocative of an inclination to taste ; so as many persons are resolute in believing that toadstools are among the most unwholesome of Nature's productions, we will give them leave to consider this one as bad as they please, hoping by sacrificing one unhappy scape-goat, to save the rest of a tribe.



Agar. radicans. Rees. art. 171

Agaricus radicans, Fr.

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PLATE XXXVI.

AGARICUS RADICATUS, *Relhan*.*Rooting Agaric.*Series LEUCOSPORUS.¹Sub-genus CLITOCYBE.²Sub-division RHIZOPODES.³

Spec. Char. A. RADICATUS. Pileus three inches or more across, at first *hemispherically convex* (not *complanate*) then flat, slightly umbonate, wrinkled from the centre, in age turned up at the margin; when moist *very viscid*, *smooth*, (not tomentose) watery-umber with a semi-pellucid appearance. Flesh white, very thin, in old specimens none. Gills watery-white or wax-colour, unequal, distant, *ventricose*, *adnate with a tooth*. Stem from four to eight inches high, about a quarter of an inch thick, *smooth like glass*, (not velvety,) shining, twisted, splitting longitudinally, tough, stuffed with silky fibres, hollow in age, rufescent, *equal*, but thickening, at the *base only*, (not gradually from the summit) into a fusiform, sub-bulbous root, terminating in a fibrous radicle, the whole root penetrating about four inches into the earth.

AGARICUS radicatus, *Fries*.*Hab.* In parks and old woodlands, near trees, common; autumn.

That Relhan's description of *Agaricus radicatus* includes the true Fungus intended above, is probable; but he and several other authorities confound with it the very singular and interesting *A. pudens* of Persoon, which Fries considers distinct from this commoner Agaric.

Not to multiply species unnecessarily is an excellent rule; but in these two plants there are some differences so remarkable, that although they may fairly claim a brotherly relation, they can scarcely be the same amiable individual, (*Agaricus pudens*,) which we shall hereafter present, to allow comparison, having been fortunate in making a very characteristic portrait of it. It will then be the proper time to discriminate further the differences we have pointed attention to in the specific character of *A. radicatus*. To those particulars there is little to add beyond what the drawing will supply. In a favourable state there is much elegance about the form of the half-expanded pileus, and the plant carries itself gracefully, being nothing like so fragile as it appears; the tough twisted stem, indeed, cannot easily be broken asunder. It owes no

¹ From λευκός, *white*, and σπόρος, *seed*. Spores white.

² From κλιτύς, a *steep* or *declivity*, and κύβη, a *head*, alluding to the shape of the pileus when young. Veil none. Pileus convex when young, not umbilicate, at length depressed or infundibuliform. Gills unequal, juiceless, unchangeable, tough, variously fixed or free.

³ From ρίζα, a *root*, and ποῦς, a *foot*. Pileus fleshy, viscid; Gills sub-adfixed. Stem rooting.

charm to mere colour certainly, and its viscosity when springing from the dewy autumnal grass, among the early-fallen leaves, does not recommend it to the delicate fingers which have not yet conquered their repugnance to a little "clean dirt." We must confess that it is a puzzling dilemma to secure Funguses, however rare and valuable to the collector, without some conscientious scruples, when the gloves are clean! Supposing the Mycologist to have grown quite reconciled to finger-contact with his treasures, with the soil in which they are growing, or the wet decaying leaves that shroud them, and that unhesitatingly the glove is withdrawn—how to put it on again is a problem very difficult of solution. Philosophically and chemically we know there is no such thing as *dirt*; yet substances exquisitely pure and clean in themselves may stain, and stick, and injure, rendering dirty, by an improper combination, such as fingers with an earthy root, or gloves with a viscid pileus. How to carry Agarics in a cambric pocket-handkerchief without reducing them to a confused amalgamation of heads and tails, has hitherto puzzled all adventurers in that speculation; but there is a more serious question involved in the affair, as it is very unlikely that you providently started with two pocket-handkerchiefs, how are you to procure the use of one? The moral application of all this is: go out in season provided with gloves which are not to be injured by contact with a Toadstool, and a tool capable of extracting even *Agaricus radicans* without more Calibanish use of the fingers than is desirable; do not break pen-knives in digging a foot deep, leaving root and blade in juxta-position, out of reach of that brittle piece of stick you found for a substitute. Do not throw away the pudding-like mess you have hitherto carried so patiently because all seem spoiled; you are only tired; some may be available and you can take a basket next time. At any rate, do not finish by grumbling at Agarics and the study of them, because you have been mis-applying all manner of means to gain an end, they were never calculated to help you to. With Funguses this may be a joke; but it is often carried into things far more important. We neglect the "old experience" which has attained to "something like prophetic strain;" life passes in gaining, or more truly "buying," experience for ourselves, till at last we have acquired wisdom to guide us safely, *if we might pass through our career afresh*. How many set off, taking no thought of "the tool," and the "basket." A weary journey of life is theirs! Vale! gentle reader, may you avoid the error!



F. R. del.

Reeve. Benham & Reeve, imp.

Peziza aurantia, *Persoon*.

PLATE XXXVII.

PEZIZA AURANTIA, *Persoon*.*Orange Peziza.*Series ALEURIA.²Sub-genus MEGALOPYXIS.³

Gen. Char. Cup more or less concave, soon expanded, the disk naked. Name from *Pezica*, a word used by Pliny to denote some fungus of this shape.

Spec. Char. PEZIZA AURANTIA. At first hemispherical, margin almost involute, nearly sessile or with a short stem, oblique, irregular; at length split, curled, and flexuous; of the clearest orange colour within, externally whitish, slightly pruinose or mealy with minute sparkling granules.

PEZIZA aurantia, *Persoon, Fries, Berkeley, Greville.*

—— coccinea, *Sowerby.*

Hab. About the roots of felled oaks. Autumn.

“All the terrestrial *Pezizas*,” says Vittadini, “may be collected and destined to the uses of the kitchen, they are all innocent and approach in their qualities to the *Helvellas* and *Morels*.” After this statement our readers may feel more curiosity as to what a *Peziza* is. It is then a member of the great natural family *Cupulati*, so called from their tendency to a cup shape, which have the hymenium superior, that is, this membrane lines the inside of the cup, which in the expanded state is of course the upper surface; the outer or inferior surface is barren. The sporidia are contained in Asci or tubes, which are fixed by one end into the hymenium, the other opening to emit these reproductive bodies, which fly out of the Asci in the form of dust, when the mature Fungus is slightly shaken; but so minute are the tubes with their contents, that a fine bloom spread upon a smooth surface is all the fructification presents to the naked eye. There are neither gills, pores, papillæ, nor any other configuration denoting its position. Many *Pezizas* are extremely minute, growing on the bark of trees or parasitically upon other vegetable substances; it is only with the larger terrestrial species that we are at present concerned. These are cup-shaped, occasionally irregular, and variously lobed, but always gathered into a central point, whether that be or be not elongated into a stem; the cup is nearly of one uniform thickness, brittle and tender, sometimes inclined inwards, or connivent,

¹ Receptacle patelliform, margined. Hymenium superior, more or less closed when young, and concave. Sporidia contained in Asci.

² From *ἄλευρον*, *meal*, fleshy or carnosio-membranaceous, pruinose or floccoso-furfuraceous from the concrete veil.

³ From *μέγας*, *great*, and *πυξίς* a *cup*. Cup open when young, or connivent. Veil superficial.

but in age generally expanded, splitting, and lax. Some of the family are enveloped in infancy, before the cup expands and loses its hemispherical shape, in a veil, which being ruptured and broken up by the growth of the pileus remains in floccose or furfuraceous fragments outside the cup. Of an elegant and interesting family, *Peziza aurantia* may vie with the proudest member of it; the tender wax-like outside of the cup contrasting delicately with the rich orange within; it is, as it looks, extremely fragile. In a side-light a kind of bloom, as upon fruit, may be detected upon the deep yellow interior, and by giving a gentle fillip it may be made to fly off perceptibly; of course this experiment will not answer beyond a certain number of times, the sporidia in each case being (according to Mr. Berkeley) only two in the present subgenus, so that the supply will be speedily exhausted. This *Peziza* is not uncommon, but is nowhere in any great abundance, and it is not a Fungus to escape notice; probably it prefers rich soil, as most of the family do, the cool heavy loam of some woodlands producing them more frequently than elsewhere. Of *Peziza acetabulum*, a very curious variety, and considered by Vittadini as *the* esculent *Peziza*, a portrait shall in due time appear; before that, however, we will devote ourselves to the task of eating it, for we regret to say of our pretty *P. aurantia* that it has never appeared here in sufficient quantity to make gustatory experiments upon; and the conscientious "Probatum est" must be withheld.

Hand-colored by J. H. R. Smith

Agrostis hyemalis (L.) Steud.

1890



MA XXX 31912

PLATE XXXVIII.

AGARICUS OREADES, *Bolton*.*Champignons.*Series LEUCOSPORUS.¹Sub-genus CLITOCYBE.²Sub-division SCORTEI.³

Spec. Char. AGARICUS OREADES. Pileus from half an inch to an inch broad, when young moist (not viscid), the margin striate, smooth, tough, elastic, convex, at length nearly plane, sub-umbonate, at first reddish buff-brown, then becoming paler, cream-coloured, the umbo generally remaining darker than the rest of the pileus, like a scorched patch. Flesh white, quite distinct from that of the stem. Gills distant, free, ventricose, pallid cream-colour, then whitish from the spores. Stem from one inch to two inches high, from two to three lines thick, equal, solid, tough, slightly twisted, composed of fibres splitting longitudinally, the interior white and silky, the bark white, turning brown in age, downy at the base, with a few fibrous roots attached to the grass, and particularly to moss. Taste grateful, strongest when dried. Esculent.

AGARICUS oreades, *Bolton*, *Fries*, *Berkeley*, *Greville*, *Withering*.

———— Pseudo-Mousseron, *Bulliard*, *Persoon* (*Traité des Champignons*).

MOUSSEYON godaille, *Paulet*.

Hab. In pastures, on downs and commons, everywhere. Annual in increasing circles; “Fairy-rings.”

Why, of all the esculent Funguses, the French name “Champignon” should in England have become affixed to the *Agaricus oreades*, is a question that may, perhaps, be answered when we find out another similar puzzle—why the common Mushroom came to be so called—that being equally unlike the Mushroom from which its name has been corrupted. One thing is indisputably proved by these mistakes, that the use of the tribe as food was adopted from France, and we may suppose that the erroneous application of their designations, arose from the place of the article enquired for by the foreign cook, being supplied by the next best thing that could be found as a substitute for it. The true French Mousseron, *A. prunulus* of Vittadini, *A. Georgii* of Fries, has never been eaten in England, although the best of its tribe, and abundant. *Agaricus campestris* has usurped not only its place but its name; while the proper name by which *A. campestris* is known in Paris, Champignon (generally cultivated for the markets as here, and then called Champignons de couche), is given by the English to everything they suppose eatable, and are afraid of, especially our present subject, *A. oreades*.

¹ From λευκός, *white*, and σπόρος, *seed*. Spores white.

² From κλίτος, a *steep* or *declivity*, and κύβη, a *head*, alluding to the shape of the pileus when young. Veil none. Pileus convex when young, not umbilicate, at length depressed or infundibuliform. Gills unequal, juiceless, unchangeable, tough, variously fixed or free.

³ From *Scorteus*, coriaceous. Pileus sub-coriaceous, dry. Gills free, sub-distant, at length pallid.

The French have several Agarics besides the true Mousseron which they call by that general name, with the addition of some distinctive epithet ; because they are all dried for sale in a similar manner, and answer a similar purpose in cookery. By Pseudo-Mousseron, the name applied to *A. oreades* by Persoon, he does not mean to imply that it is false in any injurious sense, but that it is employed as a substitute for the real one.

The true Champignon then of the French is our Mushroom, *Agaricus campestris*.

The true Mousseron of the French, Mousseron de printemps, is the Italian *A. prunulus*, *Agaricus Georgii*¹ of Clusius and Fries.

The Mousseron Godaille, M. de Dieppe, M. pied dur, or M. d'Automne of the French, is our *A. oreades*. Of the rest of the Agarics known as "Mousserons" in commerce, the identification with English species is not satisfactorily made out ; they are all sold dried, brought from various quarters, under vulgar local names, and being frequently cut in pieces to facilitate desiccation, are destroyed as botanical studies. The best way to preserve *A. oreades*, is by running a thread through each pileus where the stem has been removed, and hanging up the necklaces so formed in the sun and wind till dry ; if, however, there should be neither sun nor wind, as often happens in the showery weather when they abound, these strings may be attached to the walls or ceiling of any apartment where there is a fire ; after being thoroughly dried, a tin canister is the best thing to stow them away in for use. Withering strongly recommends them in the form of powder, and his opinion is corroborated by excellent modern authority. In drying they deposit their spores so plentifully upon each other, that a careless observer has thrown them away as mouldy. *Agaricus oreades* springs up after thunder-rains during the entire period when such rains prevail. Very rapidly developed by warm electric showers and a heated state of the earth, they are in a manner forced to a much larger size than usual, being often from two and a half to three inches across. Under these circumstances they are of more tender consistency, beautifully pure and cream-tinted ; when skilfully fried in fresh butter with simple pepper and salt, (having been dipped in egg, or not, previously, as approved), no Fungus surpasses them in delicacy, agreeableness, or wholesomeness ! As an excellent condiment, giving a most grateful flavour to gravies and soups, it is impossible to praise our humble down-trodden, neglected, Champignon too highly ; its use would save many pounds of meat in the kitchen, even of the economical, and improve the dishes of those who scorn to practice a careful virtue. Few are those now : a time of distress and difficulty has taught all, that wasteful consumption is a sin, and many will be glad to know that they may not only use a neglected treasure of nature with great advantage to themselves, but create a trade for the indigent in collecting it. Some years ago our curiosity was excited by seeing men employed at West Wickham in filling sacks with this usually despised production ; on enquiring for what purpose they were intended, the answer was, for a great à-la-mode beef house, they being "the secret" of that renowned dish, which private cooks could never solve ; we hope they will be thankful for our hint. It must be remarked that long cooking destroys the aroma of *Agaricus oreades*, a very short period being requisite to obtain its flavour. Although yielding so little liquid as not to be fit for ketchup alone, when mixed with the common Mushroom it greatly adds to the flavour, and an excellent white ketchup for friassées may be produced by macerating it in any common white wine and water in equal proportions, with sufficient salt to make the mixture keep, which must be pressed and strained after being boiled in substance, and such spice as is approved put into the bottles ; but for a lover of pure flavours, spice will spoil the sauce.

¹ This, the true *A. Georgii*, which was so called by Clusius, because it generally appears about St. George's day (old style) the 23rd of April, has nothing to do with Sowerby's *A. Georgii*, a name erroneously attributed by him to *A. arvensis*, the Horse Mushroom.

FAIRY-RINGS.

A glance at the older volumes of the Philosophical Transactions will show of how little value speculations are, which have not actual observations for their basis. To recapitulate the various fancies recorded on the subject of "Fairy-rings," would be waste of time and paper; the fact that *A. oreades* appears shortly after thunder-storms, gave rise to an opinion that the withered grass of its circles was lightning-blasted, and in Captain Brown's notes to White's Selborne, he quotes Mr. Johnson of Wetherby, a correspondent of the Philosophical Journal, to this effect:—"He attributes them to the droppings of starlings, which when in large flights frequently alight on the ground in circles, and sometimes are known to sit a considerable time in these annular congregations!" If philosophy had but condescended to use a spade, the truth would then have been *scented* at least, for the earth beneath these bare rings is white with the spawn of the Agaric causing them, and the peculiar smell either of *A. oreades* or *A. Georgii* is detected instantly: in fact, it is many times more potent than that of the Fungus itself; this is the case during the dormant season, when no pileus has shown itself for months. Wishing to exterminate some disfiguring rings of *A. Georgii* from the lawn, it was needful not only to remove the turf, but to take out more than a foot deep of the mouldy-looking fungoid soil, for to that extent it was found full of the threads of spawn; and the smell was almost intolerable to the workmen, for the idea that it is a perfume is Italian, and not easily acquired. *A. oreades* appeared in its usual well-defined rings on the same lawn in June 1847; after that, great drought prevailed, so that none recurred till September, when instead of occupying the early rings the new crop came through the turf beyond them at a distance of five or six inches from the former line, shewing that during the dry weather the spawn had extended beneath; but for this interregnum caused by the drought, we could not easily have estimated the rate of increase; in general, the diameter of the ring steals gently on with every summer rain. The earth permeated with spawn is always dry even in very wet weather; this may weaken the grass immediately above it, preparing the way for the multitude of little conical heads to push through; and the weakening of the grass encourages the growth of moss, whence comes the name "Mousseron," well befitting these children of downs and woodlands, but ill applied to the Mushroom of our dungy pastures. The propensity to form rings is common to a great number of Funguses; small puff-balls and large, the Bluet and the veritable Mushroom, probably all that increase beneath the soil, affect a *circular increase*, because, beginning with a single plant or small group, the spawn would extend equally around (under fair circumstances), and continuing to seek fresh nutriment would form a larger radius, instead of falling back upon the exhausted centre: so annually the new ring is of greater circumference than the old, and the grass grows more luxuriantly within it from having been checked for a season. Vittadini thinks that *A. oreades* derives nutriment parasitically from the grass roots, and thus kills them; he believes the downy fibres by which, matting among the herbage, they sustain themselves upright, abstract its juices; but many Agarics stay themselves thus among dead leaves and pebbles from which they can draw nothing towards their sustentation. The grass is not really killed, it is deprived of nourishment for a time, the Agarics absorbing it all to

themselves; but when this is temporary or in moist weather, little trace of it is seen. *A. Georgii* makes immense rings in which the robust family huddle so thickly together, as must destroy the grass for the season, in the same manner that *A. oreades* does, if the crop were repeated; but it does not last long, being merely vernal, so that by midsummer no trace of its giant circles remains. *A. oreades* keeps on injuring the grass at intervals, so that it gets no opportunity of rallying throughout the summer; but in winter and early spring, it makes up for the temporary apparent death, and is doubly vigorous and green. This was not the case when, to test an experiment reported of the effect of boiling water in accelerating the growth of spawn, a philosophical friend created an artificial "Fairy-ring" by the tea-kettle spout: no "redoubled vigour" succeeded to the temporary rest, but a bare, bald circle long reproached the unlucky experimentalist, while Nature's "Fairy-rings" close by, stood up several inches higher than the rest of the lawn in verdure!

Whether decayed Agarics are not excellent manure, may be here enquired? Probably they are, their chemical composition warrants the supposition, and if so, the renewed vigour of the grass may be owing to that quality in them; they may "heal the wounds they make." That long lines and irregular forms are described by Agarics instead of perfect circles, is owing to accidental causes; in fact, their various figures are generally parts of injured or interrupted rings, and the patches are never of greater breadth than the usual dimensions of the true ring. To remove them where unsightly, (and *A. oreades* abounds on lawns,) digging completely out the space they occupy, is the only effectual plan; no superficial treatment affects the spawn beneath.

Of the Agarics we have brought together in one view to contrast with *A. oreades*, *A. dealbatus* is the only one that imitates it in forming a "Fairy-ring."



Agaricus semiglobatus, Batsch.



Agaricus dryophilus, Bull.



Agaricus Pænisecl. Persoon



Agaricus dealbatus, Sowerby

A M H. del

Rees, Benham & Reeve lith. & imp

PLATE XXXIX.

[Agarics liable to be confounded with *A. oreades*.]AGARICUS SEMI-GLOBATUS, *Batsch*.*Hemispherical Agaric.*Series PRATELLA.¹Sub-genus PSALIOTA.²

Spec. Char. A. SEMI-GLOBATUS. Pileus from half an inch to an inch or more broad, perfectly hemispherical, yellow, viscid when moist, when dry shining as if varnished, smooth, fleshy; flesh white beneath the epidermis, umber near the gills. Gills very broad, adnate with a little tooth, minutely serrulate, plane, with a cinereous tinge, mottled with the dark spores. Stem from two to three inches high, from one to one and a half line thick, very viscid, shining when dry with a closely glued silkiness, fistulose, sometimes sub-bulbous, by the expansion of the channel, at the root. Ring deflexed, more or less perfect, sometimes fragments remaining attached to the edge of the pileus. Spores deep brown, frequently scattered on the apex of the stem and the fragments of the ring.

AGARICUS semi-globatus, *Batsch*., *Fries*, *Berkeley*, *Persoon*, *Greville*, *Withering*.

———— virosus, *Sowerby*.

Hab. Rich meadows, especially on horse-dung, on lawns, &c.; from May to November. Dispersed; never in rings.

That this Agaric should ever have been mistaken for the Champignon seems incredible, and yet Sowerby quotes it as most deadly, from several persons having been poisoned by its use. The ignorant presumption that could venture to collect for food, articles evidently so ill understood, cannot be too severely censured, but it appears probable that it was not as Sowerby supposed with our *A. oreades*, the “Mousseron Godaille” that these dark spored Agarics were confounded; they were probably mistaken for the “Mousseron d’eau,” which Paulet describes “from an inch and a half to two inches high, growing by thousands one over the other without touching, in low damp places near woods; pileus about one inch wide, at first very white, but soon growing brown from the change of tint the gills undergo, subject from its tenderness to crack; gills at first flesh-colour, covered with a veil like a fine spider’s web, growing dark brown, without any vestige of the veil, unequal, not adnexed; stalked about a line thick, white, straight, cylindric, nourished by a small bulb, fistulose in age; plant watery but dries well, and acquires a flavour of mushroom it had

¹ From *pratun*, *pasture ground*. Veil not arachnoid. Gills changing colour, clouded, at length dissolving. Spores brown-purple, or nearly black.

² From *ψάλιον*, a *ring* or *collar*. Veil forming a ring, sub-persistent, really partial. Stem firm, sub-equal, distinct from the pileus. Pileus more or less fleshy, convex, then campanulato-expanded, viscid or clothed with squamules or fibrillæ. Gills free or fixed, broad, becoming brown. In some species there are the rudiments of a universal veil.

not at first." Many points in this description suit both *A. semi-globatus* and *A. Fæniseii*, neither of which resemble the Champignon, and where French people committed errors, as the poor emigrants did at Winchester, it was most likely this Mousseron d'eau, (of which the botanical identification is doubtful) which they believed they had found, and not the Mousseron Godaille. At any rate, it is well to repeat Mr. Berkeley's caution, that people cannot be too careful in the use of dark-gilled Agarics; none such can be the esculent and agreeable *A. oreades*.

Order HYMENOMYCETES.

Tribe *Pileati*.

AGARICUS DRYOPHILUS, *Bulliard*.

Oak-leaf Agaric.

Series LEUCOSPORUS.¹

Sub-genus CLITOCYBE.²

Sub-division CHONDROPODES.³

Spec. Char. A. DRYOPHILUS. Pileus from one to two inches broad, at first hemispherical, then expanded, plane, or even depressed in the centre, sub-carnose, yellowish, tinged with brown or red, growing pallid, smooth, thin, tender, tough when dry. Gills pale straw-colour, very numerous, fine and close, broadest behind, nearly free or sinnato-adnexed, with a small sub-decurrent tooth, entire or serrate. Stem two or three inches high, from a quarter to a third of an inch thick, smooth, shining, equal, fistulose, inflated at the base; sometimes twisted, lax, and tortuous, when tufted; of the same colour as the pileus but growing rufous at the root. Spores white. Odour fungoid; taste nauseous, quality highly pernicious.

AGARICUS dryophilus, *Bulliard, Fries, Berkeley, Greville, Sowerby, Withering, Persoon.*

Hab. Among oak leaves, and in pine forests; from May to October.

This is a very variable Agaric, and it is almost impossible to make a description of it more than generally appropriate to the different specimens collected at periods of dry or wet weather, among summer mosses or autumnal leaves. One circumstance, however, will invariably serve to distinguish it from *A. oreades*; the close fine disposition of the gills, so different from the distant arrangement with broad irregular spaces between them, which those of the esculent Fungus display. Another point to be remarked is, that the stem of *A. dryophilus* is one of the best examples of the truly fistulose or piped kind; while *A. oreades* has a solid stem, the outer bark of which, indeed, is tougher than the shining satiny internal fibres, but still it is essentially solid, never hollow except, like a tree, in extreme old age and decay. Our Champignon too, though very brown when water-soaked, or dried, has never at any time the slightest tinge of red about it; the stem in particular is pure white while fresh, and acquires only a brownish hue in drying; but *Dryo-*

¹ From λευκός, *white*, and σπόρος, *seed*. Spores white.

² From κλίτος, a *steep* or *declivity*, and κύβη, a *head*, pointing to the shape of the pileus when young. Veil none. Pileus convex when young, not umbilicate, at length often depressed or infundibuliform. Gills unequal, juiceless, unchangeable, tough, variously fixed or free. Spores white.

³ From χόνδρος, a *cartilage*, and ποῦς, a *foot*. Pileus tough, dry. Gills nearly free, close. External coat of the stem sub-cartilaginous.

philus has always a red base to the stem, and that stem, moreover, is swollen into a sort of hollow bulb; several are frequently confluent at this thickened base, but Champignons, how closely soever they may grow in the ring, are independent and may be separated from each other without violence. By its *fine close gills*, its *piped stem*, and *reddened swollen base*, this mischievous Agaric may be distinguished from the wholesome one *with certainty*. That the bad character given of *A. dryophilus* is deserved came under our own observation. About a dozen of them were eaten by mistake for Champignons by an elderly gentleman, whose sense of odour and taste were considerably impaired; at the moment no unpleasant effect was produced, but some time afterwards a sense of burning in the fauces and suffocation caused great apprehension. It subsided, however, under proper treatment with no ultimate bad result; without instantaneous remedies the termination might have been fatal; the best and simplest is a tea-spoonful of ready-made mustard in a tumbler of warm water, nothing being *certain* to prevent bad effects, but *removing the cause of them* by an immediate emetic.

Order HYMENOMYCETES.

Tribe *Pileati*.

AGARICUS FÆNISECII, *Persoon*.

Eddish Agaric.

Series PRATELLA.

Sub-genus PSILOCYBE.¹

Spec. Char. A. FÆNISECII. Pileus from one to two inches broad, sub-carnose, hemispherical, semi-ovate or campanulate, the margin transparent and minutely grooved by the backs of the gills beneath; brown umber turning paler, banded with various shades of brown when losing its moisture; in decay it has a burned appearance, and at length dries up and is black. Gills adnexed, distant, broad, ventricose, mottled umber, the extreme margins white. Stem from two to three inches high, one and a half line thick, naked, smooth, rufescent-umber, sub-flexuous, fistulose, at first slightly pulverulent, the apex striate, the base cottony. Spores black.

AGARICUS Fæniseicii, *Persoon, Berkeley*.

Hab. Among short grass upon lawns, &c., after continued rain in spring, summer, and autumn; dispersed freely, never in rings.

To Mr. Berkeley's excellent description of this Agaric, which grows frequently on the same sites as the Champignon, there is little to add. It is an elegant little species, and generally campanulate, though sometimes of the other forms mentioned; in drying it often cracks at the apex, and when more than usually saturated with rain inclines to so deep a brown as to be nearly black, but is at no time viscid.

Eddish is an old English word for latter-math, the sort of grass this Agaric prefers to the ranker unmown herbage. Of its qualities we know nothing; it resembles one of the very imperfect delineations given by Sowerby, as portraits of poisonous Agarics mistaken for Champignons; but no further difference need be pointed out, than that *the spores are black* in *A. Fæniseicii* instead of *white*, as in *A. oreades*.

¹ Erom ψιλός, *naked*, and κύβη, *the head*, or pileus. Veil marginal, thin, flocculose, very fugacious. Stem hollow, rarely stuffed, when young tough, equal, sub-fibrillose, often viscid. Pileus conic or convex, then expanded, almost distinct from the stem. Gills rather broad; substance tough, persistent, never deliquescent.

AGARICUS DEALBATUS, *Sowerby*.*Dirty-white Agaric.*

Series LEUCOSPORUS.

Sub-genus CLITOCYBE.

Sub-division DASYPHYLLI.¹

Spec. Char. A. DEALBATUS. Pileus from three-quarters of an inch to two inches broad, white, greyish cream-colour, or tinged with rose; at first convex, then plane, orbicular, the extreme margin only involute, or variously repand, lobed, and undulate; sometimes depressed from the turning up of the margins, which in age are entirely unrolled; dry, smooth, shining, but clothed with a minute farinaceous silkiness, which turns brown when bruised and retains the impression of the fingers; in wet weather water-soaked in concentric zones, forming small ridges when dry. Flesh thin, pallid. Gills adnate, not decurrent, though apparently so in aged specimens, from the depression of the pileus, very close, cream-white, moderately broad. Stem an inch or more high, from two lines to a quarter of an inch thick, often curved as if eccentric, flexuous, greyish-white or rose-tinted, turning brown when handled, pruinose at the apex, stuffed, the fibrous bark very distinct. Odour fungoid and disagreeable.

AGARICUS dealbatus, *Sowerby, Fries, Berkeley, Greville.*

Hab. In rings, or gregarious in pastures; often caespitose and tiled one over the other. Autumn.

Of all the Agarics likely to be confounded with the true Champignon, this is certainly more resembling it in appearance and manner of growth than any other; it is, therefore, fortunate that although not an agreeable, it does not appear to be a dangerous article of food: we have known it mistaken for the excellent *A. orcella*, and eaten without any worse result than slight nausea. It abounds in some seasons, then does not appear during an interval of several years; as far as our observation of its habit goes, those seasons when the old pastures are very bare and the herbage weakened by long drought, are favourable to its development; the late autumnal rains then bring it up in abundance, always where least resistance is offered by the grass, so that the rings are seldom regular; but observation will prove that the close growing groups of the Agaric are parts of a circle if not an entire one. Very often *A. dealbatus* succeeds in the old rings of *A. oreades*; both of them prefer a poor gravelly soil, which is speedily acted upon by electric showers. *A. dealbatus* is later in season than the general autumnal crop of the Champignon, but they may be seen in profuse circles in the same field; the *Dealbatus* shining, glairy, and whiter than the buff-suited *Oreades*.

A. dealbatus always has the margin at first rolled inwards.—*A. oreades*, never.

A. dealbatus has very fine close dingy whitish gills.—*A. oreades*, distant ones of a pure pale creamy tint.

A. dealbatus water-soaks in zones of a grey brown.—*A. oreades* absorbs much wet, but becomes dark leather-brown coloured, the deepest shade of buff; never grey, and never zoned.

The smell of the Champignon is mushroom-like and agreeable, and the taste raw, peculiarly so: but the smell of *A. dealbatus* is too fungoid to render the tasting desirable, and while the Champignon increases in odour as it dries, the other acquires no scent.

Having thus attempted to introduce the Champignon to her readers, without a possibility of error, Mrs. Hussey can only add, that she will send some to any one requesting it, when the season comes round.

¹ From *δαρὺς*, close, and *φύλλον*, a leaf, in allusion to the crowded gills. Pileus dry, smooth. Gills close, decurrent, or acutely adnate.



PLATE XL.

AGARICUS PRATENSIS, *Persoon*.*Meadow Agaric.*

Series LEUCOSPORUS.

Sub-genus CLITOCYBE.¹Sub-division CAMAROPHYLLI.²

Spec. Char. A. PRATENSIS. Pileus from one inch to three inches broad, firm, sub-compact, becoming partially expanded towards the margin, the centre remaining more or less convex, as if umbonate; margin often cracked, frequently contracted or lobed; dry, smooth, buff, orange-reddish or brownish. Gills thick, decurrent, distant, connected by veins, *separable from the flesh of the pileus*, of a paler shade of the same reddish buff-colour. Flesh nearly white, thick in the centre, thin at the margin, firm, elastic. Stem short, stuffed, attenuated below, white or buffish. Odour and taste agreeable; esculent.

AGARICUS pratensis, *Persoon, Berkeley, Fries, Greville*.

Hab. Pastures. August to November.

The gills of this Agaric are remarked upon as being “separable from the flesh of the pileus;” in the Chanterelle family they are not, and this point being attended to, may serve to decide the question of a given Fungus being an Agaric or a Cantharellus. In the present case the likeness to *C. cibarius* is so strong that mistakes would be extremely probable without some test: it is true the Chanterelle is redolent of luscious green-gages or melting apricots from the south-wall, or Iris Zic-Zac distilling its fragrant honey in the fervid sun for the delectation of the ants; but every one has not a perfect sense of smell, so that to rely on it entirely for a guide would be trusting too far. *Agaricus pratensis* is commonly of a clean buff-tint with a tinge occasionally of a redder shade; but very large specimens of most luxuriant developement from Hampshire, had the pileus of a deep dull orange. The odour is slight but agreeable, and it is esculent; so also is an Agaric, nearly related to it, *A. virgineus*, but the latter is much more common, and generally white, only turning yellowish-brown in fading, so that it has been mistaken for the true *Pratensis* by those who were unacquainted with both Funguses. *A. virgineus* grows in rings occasionally, or rather in groups forming portions of a circle; it is much more brittle than the *Pratensis*, the latter being extremely solid and firm, and requiring gentle stewing for some time; neither can be recommended as among the best of the mushroom tribe, but they will furnish a tolerable dish to the amateur of the food in the deficiency of the

¹ From κλίτος, a steep or declivity, and κύβη, a head, pointing to the shape of the pileus when young. Veil none. Pileus convex when young, not umbilicate, at length depressed or infundibuliform. Gills unequal, juiceless, unchangeable, tough, variously fixed or free. Spores white,

² From καμάρα, a vault, and φύλλον, a leaf. Pileus sub-compact, dry. Gills distant, vaulted, decurrent.

more dainty kinds. *Agaricus pratensis* of Sowerby is not the one under consideration but *A. oreades*, the Champignon. The shape of the vaulted gills is a striking peculiarity in the few Agarics which are placed in the division Camarophylli; the gills are also very thick and distant, and connected by prominent tumid veins. In wet weather the pileus cracks from excessive expansion, and contracting again forms a number of concentric wrinkles in the smooth leathery epidermis, but it is not zoned. The true shape and character of *A. pratensis* is that given in the drawing; soil and season cause it frequently to vary much from this portrait, but a little attention will enable the original to be identified. It has white spores; it is not furnished with milky juice, it has no kind of veil, consequently no sheath or ring at any period of growth; and the name Clitocybe, from the shape of the pileus *rising in the middle*, points out a distinction from the class Omphalia, in which the pileus is *dimpled in the centre* when young.

With a *Virgineus* it will not be confounded, if the colour and consistency are carefully examined; nor with *C. Cibarius*, if the test of the gills being *separable from the pileus* or *not*, be applied; there is no dangerous species allied to it.



A. M. H. del

Agaricus emeticus, Schaeffer.

Reeve, Bertram & Reeve imp.

PLATE XLI.

AGARICUS EMETICUS, *Schæffer*.

Series LEUCOSPORUS.

Sub-genus RUSSULA¹

Spec. Char. AGARICUS EMETICUS, *Schæffer*. Pileus from two to five inches broad; glutinous *while young*, compact, smooth, hemispherical, then plane and depressed in the centre; sometimes irregularly bent and undulated or compressed till nearly square; margin thin, striato-sulcate; purple, rose-red, blood-red, fuscous yellow or nearly white. Gills broad in front, narrower behind, rigid, thickish, connected by veins mostly equal with a few smaller interspersed, always white. Spores white (not yellowish ochre). Stem from two to three inches high, longitudinally rugulose, firm, solid, white or tinged with the colour of the pileus. Extremely acrid and poisonous.

AGARICUS emeticus, *Schæffer*, *Berkeley*, *Vittadini*.

———— integer, *Sowerby*, *Bolton*.

RUSSULA rubra, *Fries*.

Hab. On the borders of woods, and principally under old oaks; from July till November.

Few Agarics can boast so elegant a developement as this, whether the garb it selects for the nonce, be of a lovely rose-colour, or pervaded with lilac having a changeable effect, or blotched like a striped *Camellia*, with rich crimson and white, according to the screen it has received from neighbouring plants in its growth. Each of these various colours, at various times and places, adorns the pileus, relieving it from the pure white gills below: it gives no warning by its scent or by any other external circumstance of its deleterious quality; if the ignoramus should be tempted to *taste*, for a few moments all appears harmless, for it is *tardily* acrid: but it fully makes up for the delay, as the tortured investigator, with burning lips and fauces, and tearful eyes, seeks in vain for alleviation. If not swallowed, however, the effect shortly subsides; it is not an Agaric likely to prove fatal, because the acrimony is not lost in cooking, and they who could eat enough to harm themselves seriously, must have fire-proof palates. Vittadini, to be sure, tried the experiment of eating them, although he found them most nauseous; but this is a devotion to the cause that even the scientific are not likely to imitate, much less the student, or mere amateur. Dr. Badham has taken great pains to distinguish the various esculent Russulæ from the noxious ones; it is a very difficult thing for the experienced to pronounce upon some specimens even with close investigation, so we can only say to the inexperienced, study the Russulæ as much as possible, but never trust your own investigations, however close they may be, so far as to have a dish of them dressed without testing every one by masticating

¹ A name formed by Scopoli from *russulus*, red; veil none; stem smooth, spongy within. Pileus with a fleshy disc, and thin margin, which is not inflexed at any period of growth. Gills juiceless, either all equal, or with a few shorter intermixed or forked, rigid, brittle, broad in front, narrow behind, acute, properly free, but apparently adnato-decurrent from the diffusion of the stem into the pileus. Spores white or sub-ochraceous. Gills white or yellow. Large or middle sized Fungi, rigid, persistent, solitary, growing on the ground.

a morsel crude; this will prove a pungent and sufficient warning, if you have carelessly examined their botanical characteristics, and an excellent fungus treat by way of recompense, if you have made out the esculent kinds, for there are no mushrooms so delicate and wholesome as the Verdette and the *Agaricus lepidus*, *Russula lepida* of Fries. Both these we intend hereafter to introduce, and will then enter further into the distinctions proper to each; but no written description of either could enable the collector to decide upon specimens so well as the comparison of their portraits with each other will.



PLATE XLII.

EXIDIA GLANDULOSA, *Bulliard*.*Witches' Butter.*

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*Gen. Char.* Receptacle margined, gelatinous, tremulous, distended, homogeneous, covered above only with the hymenium. Sporidia at length bursting forth elastically. Named from *exudo*, to *exude*.<sup>2</sup>

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Spec. Char. EXIDIA GLANDULOSA. Effused, more or less plane, thick, undulated; the hymenium beset with conical papillate spicules; varying in colour from whitish to brown, and deep cinereous, at length black; generally somewhat turbinate; slightly plicate and gyrose below, much wrinkled and lacunose above; substance tender, thin, gelatinous, smooth above, beneath rough like crape. The entire plant collapsing when dry, so as to be with difficulty recognised; re-assuming its pristine form with the application of moisture, and giving out a bright brown tinge to water.

EXIDIA glandulosa, *Fries, Berkeley.*

TREMELLA glandulosa, *Bulliard, Greville, Withering.*

----- spiculosa, *Persoon.*

Hab. On trunks and fallen branches, particularly of ash. Autumn and winter.

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If at a cursory glance the present subject from its hue and style of growth should be confounded with *Bulgaria inquinans*, very little attention is needed to ascertain that in botanical characteristics they differ essentially. The *Bulgaria* is a top-shaped cup, at first closed, filled with a gelatinous substance, in which the reproductive bodies are immersed; *Exidia glandulosa* is not cup-shaped, but nearly plane, as to its entire configuration, that upper plane surface being smooth and shining, but wrinkled into a mesh-like series of shallow cells or depressions, something like a Morel; and upon this surface only the hymenium is situated. The inferior sterile side is sub-tomentose, "rough like black crape" describes it exactly: being of a very flaccid consistence when moist, the margins often hang over so as to conceal the under surface entirely till lifted up; and this reversed position it retains in drying; then care is required to discriminate it from *Tremella fimbriata*, a rare plant, but in colour, form, and general appearance strongly resembling it. *Tremella fimbriata* is gelatinous and tremulous when moist, brittle and crisp when dry, so is our *Exidia*; the *Tremella* is black, plaited and corrugated, gathered beneath into a central point, which is inserted

<sup>1</sup> Receptacle various in form, of a more or less gelatinous substance. Sporidia free, at length bursting forth.

<sup>2</sup> The name *Exidia* gives a wrong impression, that of a liquid substance oozing out; this is not the case. *Exidias* grow out, as *Tremellas* do, from beneath the bark, taking their origin among the fibres of the inner stratum; but in the very first stage of development, they are membranaceous rudiments of the future plant and not mere gelatine exuded.

between the channels of the bark, but although its lobes may be flaccid their character of growth is *vertical*, *not plane and prostrate*, or even *reversed*, as is the case with the *Exidia*. Both Funguses give out a brown tint to water. With many points that may cause confusion between them, the main fact to be noted is that the *Exidia* is an *Exidia*, and the *Tremella* a *Tremella*, and to the professed botanist this would be note sufficient; we are not writing, however, solely for botanists, and therefore will mention again the great difference between the two classes.

The *Tremellas*, however they may be folded, plaited, corrugated, lobed, or inflated, consist of an entire sac-shaped membrane never opening into a cup, nor forming the ear-like shapes which give a name to the great division *Auricularini*, under which the *Exidias* were formerly placed; these true *Tremellas* being thus sac-formed, have *no decided edges* that can be properly designated as *margins*. *Exidias* consisting of a more or less open expanding membrane have *margins*; also the hymenium covers every external part of a *Tremella*, whilst in an *Exidia* only the upper surface is fertile, as in the *Pezizas*. *Tremella fimbriata* (as well as several other species of that class) when laid upon a glass in a fresh moist state, deposits its spores plentifully and is frosted over with them when under a microscope, the fructification resembling that of the *Agarics*; but in the *Exidias* the spores are exploded from thread-shaped tubes in a somewhat similar manner to those of *Pezizas*.

It has been said that those Funguses which are capable of revivification can undergo the process only once, the second soaking fails; but if this is true of *Agarics*, it is not borne out by experiments on the gelatinous kinds, such as we are now treating of; they swell out and collapse again not only with every shower and drying gale while growing, but on the application of water artificially and subsequent desiccation, at several successive soakings; boiling water acts most efficaciously, but of that they certainly will not bear a repetition. The whimsical name "Witches' butter" has not the recommendation of any kind of appropriateness such as renders many country epithets interesting; black it is, and that is all that can connect it with "Black Art" besides its being a Fungus; but butter it resembles in no characteristic whatever; the student will be greatly misled in his search for it, if he imagines it to do so. It has no peculiar quality, nor is it of any utility that we are aware of; but it deserves notice, and it seems well to elucidate the differences between several species which careless observers might confound together.

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F.R. del.

Reeve, Benham & Reeve, imp

*Polyporus suaveolens*, *Linnaeus*.







## PLATE XLIII.

POLYPORUS SUAVEOLENS, *Linnaeus*.*Anise-scented Polyporus.*

*Spec. Char.* POLYPORUS SUAVEOLENS. Pileus dimidiate, generally solitary, of a fleshy, somewhat corky substance, zoneless, villous white. Pores rather large, brownish; when dry very light and soft. Strongly scented with aniseed.

POLYPORUS suaveolens, *Fries, Berkeley*.

BOLETUS suaveolens, *Linnaeus, Sowerby*.

*Hab.* On stumps of willow. Not common. Annual.

Linnaeus seems to have had a great liking for the flavour of Anise with which his countrymen try to make their bad brandy palatable; it has however certain rat-catching associations in England which have perhaps been a reason for its exclusion from polite society in any form among us, so that unless it were explained that by "sweet-scented" Linnaeus meant this peculiar odour, the English student would be seeking for something in which the rose or violet scent might be expected to predominate. After all, a love for the smell of Anise is not a more remarkable national taste, than a thousand others acquired in different places; the "perfume" of the Italian *Prunulus*, for instance, is not exactly estimated by the English labourer, whom we have heard complaining of the disagreeable task of exterminating its spawn; and garlic is nearly as unpalatable to a Briton, as its Persian substitute Assafoetida. Many vegetables also have a much more refined and delicate odour when their freshness hangs about them, becoming rank and chemist-shop like, after being distilled or resolved into essences; all preparations of that most fragrant thing, a lemon, are failures; and so it is with both the anise-scented Agaric and *Polyporus suaveolens*: when in a fresh state and sound condition, they are much more agreeable than chemical preparations of Aniseed. This *Polyporus* always retains some scent when dry, in which state it will keep for years; and although the growth is annual, the dried remains of a former season may be found in the stump where a new pileus has replaced it. When any *Polyporus* then is called annual, it is not to be taken in exactly the same sense, as when Phenogamous plants are spoken of; many herbaceous flowers entirely disappear except a few dried stems, and shoot afresh from their buried but living roots every year, and these are perennial, not annual. Now the case of a fungus, in which fresh pileuses spring from the old site containing their rudiments, while the dried up skeleton of last season yet remains attached, seems parallel to that of herbaceous perennials; but where funguses are concerned the terms annual, biennial or perennial, apply not to the endurance of the substance, but to the period required to bring it to perfection, and after which it ceases to grow. It is then whether the increment of one particular fungus runs on from year to year, or whether it embraces two seasons, or ceases with one, that is considered in classing them; *Polyporus Igniarius* continues with an annual aggregation of substance for twenty years; and its age may be ascertained by counting the concentric ridges, which, alternating with depressions, mark periods of activity or of rest; just as in a section from a tree, the age

may be determined by its rings of growth. Perhaps the tyro may observe that in the list of synonymes there appears *Boletus suaveolens*, Linnæus, as if in contradiction to the title *Polyporus suaveolens*; now this is not intended, but that the name of the class being modernly *Polyporus*, Linnæus is still cited as the authority for the species, although he called it a *Boletus*, in which he was imitated by Sowerby, Withering, &c., his more immediate followers; but the term is now very properly restricted to a class, formed according to strictly natural arrangement, which includes only the soft fleshed central stemmed varieties, with tubes separable from the pileus, and each other; these, having in youth a rotund or ball-like appearance, may fairly be named *Boletus*, but the title is quite inappropriate to the irregular, generally dimidiate class, growing on trees &c., and which, having pores sunk into the pileus itself or formed from the fibres of its substance, instead of being separable from it, are considered as the true type of *Polyporus*. The great family of the *Polypori* then includes all pored Funguses, of which *Boletus* is only one division, and *Polyporus* another. In virtue of this arrangement it is clear that although every *Boletus* is a member of the *Polyporei*, it by no means follows that a *Polyporus* is a *Boletus*.

Nothing can be more objectionable than novel arrangements or changes of nomenclature without sufficient cause; but in this case every one who will take the trouble to consider the subject, must perceive that differences enough exist between the present family of *Boletus*, and those now termed *Polyporus* to justify a separation.

*Polyporus suaveolens*, when dried and powdered, has been employed, it is said successfully in consumptive cases; it appears at any rate to have effectually checked distressing night perspirations and other attendant symptoms of that melancholy disease. It is of too tenacious a consistence to be used as food, and too scarce to render that an important consideration.

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F. R. del

*Peziza coccinea, Jacquin*

Reeve, Benham & Reeve, hth. & imp.







PLATE XLIV.

PEZIZA COCCINEA, *Jacquin*.

*Carminc Peziza*.

Series LACHNEA.<sup>1</sup>

Sub-genus SARCOSYPHA.<sup>2</sup>

*Gen. Char.* Cup more or less concave, soon expanded, the disk naked. Name from *Pezica*, a word used by Pliny to denote some fungus of this shape.

*Spec. Char.* PEZIZA COCCINEA. Cup an inch or more broad, infundibuliform, within rich carmine colour; externally whitish, tomentose, with short adpressed down; stem from a quarter of an inch to an inch high, tomentose like the cup.

PEZIZA coccinea, *Fries, Berkeley, Greville, Withering*.

——— epidendra, *Sowerby*.

*Hab.* On decaying sticks, sometimes penetrating through the soil; in woods. Spring.

However opinions may differ as to the beauty of Funguses in general, this plant in particular always meets with admiration. The whitish down on the exterior is the remains of a veil in which Nature has carefully enveloped one of her prettiest productions; besides which, further to ensure the lovely carmine hymenium from injury, the lips of each cup are not merely connivent in early youth, but meet closely; so that even if soil should at first cover the head of the plant, it will find its way through without a grain of earth or atom of decaying vegetation defiling the interior of the cup. When it comes to be expanded, the colour is so pure and brilliant as to defy the limner's art, resembling that of *Lobelia fulgens*; in age the margins split, and sometimes turn back. The length of the stem depends on the site of the plant; it is nearly obsolete when growing above ground, and much prolonged if it has any distance to push through in seeking the surface; however this may be, we have never found the root attached to any other substance than decayed wood and sticks, not timber. In the districts of Kent and Sussex, known as the Weald, and which are abundantly covered with copse woods, *Peziza coccinea* is often found; but there are many parts of England where it is a perfect stranger: it will, however, be easily recognized by any discoverer; no other of the family possesses the same bright red tincture, except some very minute species, and the *Peziza aurantia* is very much larger and of an orange hue; not the slightest tinge of yellow enters into the colouring of our present subject; "Carminc" *Peziza* is exactly the suitable title. Under *Peziza aurantia*,

<sup>1</sup> From *λάχνη*, *down*. Waxy, rarely fleshy, externally hairy or villous from the persistent distinct veil. Cup closed when young.

<sup>2</sup> From *σὰρξ*, *flesh*, and *σκύφος*, a *cup*. Fleshy or carnosomembranaceous. Crust none.

which occurs in an earlier division of the tribe, the student will find particulars of their general character and qualities, which it would be superfluous to repeat here. Whether *Peziza coccinea* has any virtue beyond that of pleasing the eye, we know not—for *us* that sufficeth; but now comes the reflection, “For whom is the beauty spread over solitudes where man comes not, designed?” It surely cannot be for *his* delectation, although to himself, as her king, he arrogates all the offsprings of the teeming Earth,—for these lovely objects shrink before him, disappearing from the spots his foot treads and his labour breaks in upon. Who then in those sequestered forest-tracks admires, or employs, a myriad of lovely things, springing up season after season, till centuries have passed? Is so much done in vain? Is nature thoughtless in her prodigality? Or are the *animated beings* that skip, and play, and sing among those beautiful *inanimate* creations, able to appreciate them? Not as we do—no one can dream that; but perhaps the squirrel pricks his tufted ears and glances his bright black orbs with increased vivacity, when varied objects and gay colours are around him, and is a happier squirrel because Nature is so bountiful. Perhaps the rabbit breakfasting on dewy herbage admires the ornaments of his table although he cannot eat them, and stays his munching to examine what his rabbit mind feels to be “the beautiful.” Perhaps the mavis sings more eloquently to his brooding mate, telling her the world they live in is so fair! Or perhaps—the Fairies bathe their ivory limbs in those becoming carmine lavers, filled with the purest dew of Heaven!—Who shall contradict our “fond fancies?” No one *with authority*, and our faith, good reader, is as pleasant as your incredulity; but seek not, if we have converted you, to explore those moonlight glades; we do not fear that, like Arthur, you should be spirited to fairy-land—but you will assuredly catch the Ague!

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F.R. del.

Reeve, Berham & Leeve, imp.

*Agaricus granulosis, Batsch*







## PLATE XLV.

AGARICUS GRANULOSUS, *Batsch*.*Small yellow scaly Agaric.*

Series LEUCOSPORUS.

Sub-genus LEPIOTA.<sup>1</sup>


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*Sub. div.* \* \* \* \* Veil fixed or fugacious; gills sub-adnexed.

*Spec. Char.* AGARICUS GRANULOSUS. Pileus from half an inch to an inch broad, in general dull reddish yellow, but occasionally ferruginous, pink, vermillion, or white. Fleshy in the centre, at first convex or obtusely umbonate, at length often plane or depressed, somewhat wrinkled, covered with furfuraceous scales, the remains of the universal veil. Gills white or yellowish white, fixed to the stem, ventricose, sometimes nearly free in depressed specimens. Stem from one to three inches high, from one to four lines thick, slightly incrassated at the base, when young solid, but in age hollow, with a core occasionally running down from the centre of the pileus, and the base stuffed; sometimes the stem is slightly compressed, with a subfugacious flocculose ring about the middle, above which it is slightly fibrillose, and beneath it scaly like the pileus, from the same cause, the remains of the universal veil adhering to it.

AGARICUS granulatus, *Batsch, Fries, Berkeley, Persoon*.———— ochraceus, *Bulliard*.———— croceus, *Bolton, Sowerby, Withering*.

*Hab.* Woods, especially of Scotch fir, on heaths among moss, &c., and on the stumps of old fir trees. Subgregarious. Autumn.

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Those Agarics which are included under the head *Lepiota* vary much in stature and general habit; indeed it could scarcely be supposed that botanical characteristics should exist to place in the same class, members so different from each other when cursorily viewed. The *Lepiotes* stand between the sub-genus *Amanita* and the sub-genus *Armillaria*, all three being under the series *Leucosporus* (white spored).

It appears advisable to place their distinctive peculiarities clearly before the student. *Amanita* has two veils; one universal, one partial. *Lepiota* has only one veil; that being universal. *Armillaria* has one veil only, that being partial; so that *Amanita* possessing these characteristics of both the other sub-

<sup>1</sup> From *λεπίς*, a scale. Veil single, universal, closely adhering to and confluent with the epidermis, when burst forming a more or less persistent ring towards the middle of the stem; stem hollow, stuffed with more or less densely interwoven arachnoid threads, equal or thickened at the base, fibrillose. Pileus more or less fleshy but not compact, ovate when young, soon campanulate, then expanded and umbonate. Flesh white, soft. Gills unequal, never distant or decurrent. Colour of the gills white, in some varieties yellow. Persistent autumnal fungi, growing on the ground; not dangerous.

genera, is an Agaric in its most perfect state.<sup>1</sup> It is of no consequence that in the mature plant a part of the universal veil should be wanting, or, as it is styled, "obliterated," any more than that the ring should be in some cases "fugacious;" provided the Agaric had both those appurtenances in its first developement, it comes under the head *Amanita*.

*Lepiota* has a universal veil only; the inner veil of *Amanita*, which stretches from the stem to the pileus, having its origin high up on the stalk within it, covering the gills separately from the outer screen, is wanting in *Lepiota*, but in place of it, the universal veil itself being contracted to the stem, beneath the pileus, covers the gills and forms a ring, which attaches itself more or less permanently to the middle of the stem, and sometimes slips up and down upon it, thus showing that this appendage is independent of the stem. *Armillaria* precisely reverses the case of *Lepiota* having the partial veil springing from the stem and covering the gills, but being destitute of the universal veil *Lepiota* possesses.

These are the distinctive characters of these three sub-divisions of white-spored Agarics, which the inexperienced might confuse together. There are other species furnished with similar appendages, but they have coloured spores and therefore come under the series *Cortinaria*.<sup>2</sup>

*Agaricus granulatus* is nearly the smallest of the *Lepiotes*, and the only English one that is yellow capped; <sup>3</sup> its very ventricose gills are a remarkable feature, giving it a curious pouter-pigeon appearance. The ring has sometimes disappeared in aged specimens, but a trace remains even then of its former position, for the remains of the veil are attached in scales below; the cap is more or less scaly from the same cause, and, when these two circumstances are combined, we may be pretty sure a ring was once present at the point of demarcation on the stem, where the scales cease.

None of the *Lepiotes* are dangerous; the best of Mushrooms, *A. procerus*, is one of them; this little example is never in sufficient quantity to make its esculent property of any value, or indeed to test it with conviction.

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<sup>1</sup> The reader will see this clearly explained at the close of the introduction, by a drawing of *A. Phalloides*.

<sup>2</sup> In *Tricholoma* there is a partial fibrillose fugacious veil but it forms no ring, being arachnoid, or composed as it were of spider's web.

<sup>3</sup> Unless we except the *Agaricus Caepestipes*, which turns yellow in fading, being originally white; it is however confined to bark-beds, so cannot be confounded with *A. granulatus*.







F. R. del

Reeve, Benham & Reeve, imp

*Polyporus sulphureus*, Bull.







## PLATE XLVI.

POLYPORUS SULPHUREUS, *Bulliard*.Var. CLAVATUS, *Fries*.*Sulphur-coloured Polyporus.*

*Gen. Char.* Hymenium concrete with the substance of the pileus, consisting of subrotund pores with their simple dissepiments. Name  $\pi\omicron\lambda\upsilon\varsigma$  many; and  $\pi\acute{o}\rho\omicron\varsigma$  a pore; in allusion to the many pores of the hymenium.

*Spec. Char.* POLYPORUS SULPHUREUS. Sessile, irregularly imbricated, dimidiate or branched, forming confluent masses from two to three feet high. Each pileus is undulate, sometimes slightly zoned, alternately raised and depressed in concentric bands; the margin waved, yellow, orange, or cloudy reddish yellow, smooth; the mass of pores plane, extremely minute, sulphur-coloured. Spores abundant, white. "Dry specimens are often encrusted with crystals of binoxalate of potash." (*Grev.*) "When in fullest vigour it is full of sulphur-coloured milk." (*Fries*). The flesh is at first sulphur-colour, then white, where the fungus breaks up in deep cracks. Heavy when full of juice; extremely light when dry. Smell disagreeable, acid, and foxy; taste subacrid, slightly astringent.

Var. CLAVATUS. Polymorphus, much branched, entirely covered with most minute pores, sulphur-coloured.

POLYPORUS sulphureus, *Berkeley*, *Greville*.

POLYPORUS sulphureus, *var. clavatus*, *Fries*.

BOLETUS sulphureus, *Bulliard*, *Sowerby*, *Withering*.

AGARIC styptique, *Paulet*.

Upon trunks of wild cherry, plum, &c.; the variety *clavatus* generally on yew. Annual. Summer.

So very striking and beautiful a fungus always commands attention when met with; it differs so much, however, in its manner of growth, that various specimens can scarcely be supposed to belong to the same species. The present drawing was made from a branched group, growing on the summit of an aged yew tree, in Stowe Park, Bucks; in which position it never assumed the character of a pileated *Polyporus*, as commonly understood, but, like sportive examples of *P. squamosus* under similar circumstances, threw up a luxuriant growth of ramified substance, having the surface entirely porous, and, of course, entirely of the lovely primrose hue which the pores constantly display. In this state it is the *Polyporus clavatus* of *Fries*. On the contrary, on a wild cherry tree at Hayes Place, which had a longitudinally decaying fissure, the same *Polyporus* grew in imbricated layers, occupying a space of ten or twelve feet in height, and only here and there interspersed with finger-shaped, entirely pored protuberances. On cutting through the lower part of this mass to obtain a specimen, an abundant yellow juice flowed out; about a pint was discharged

in the course of the ten minutes it was watched, and it continued to trickle from the wound for several days; this juice was slightly astringent, sub-acid, and crystallized in drying. The odour of the *Polyporus* is not very powerful when moist, but most disagreeable while undergoing the process of desiccation. During this same process a remarkable fact was observed: the *Polyporus* had been placed for safety in a cupboard, generally the receptacle, amongst other out-of-door matters, of the cat's dinner; and in the evening, the children lodged a complaint that a plate of most disagreeable fish, so far advanced in decomposition as to afford a brilliant light, had been left for poor pussy, who of course spurned it with infinite disgust. This matter of fish met with instant denial; what then was the offensive substance? The specimen of *P. sulphureus*, as brilliantly phosphorescent, and quite as malodorous, as ever was decaying mackerel. This phosphorescence of Funguses is not new; Dr. Badham mentions it, and Paulet states it of the subject under consideration; but although he may, as well as ourselves, have seen *P. sulphureus* giving out a shining light, he is wrong in identifying it with Pliny's Fungus which did the same thing. The statement of the Latin author is that on the top of Glandiferous trees (not necessarily oaks) there grew a *white, odoriferous* Fungus, which, shining by night, pointed out where to gather it in the dark. This is probably the white Agaric of commerce used in medicine, highly resinous and powerful in its qualities, which grows on larches only, and with which *P. sulphureus* must not be confounded—but it is not likely it should be in England, as it is not found here. “Galliarum glandiferæ<sup>1</sup> maxime arbores agaricum ferunt. Est autem fungus candidus, odoratus, antidotis efficax, in summis arboribus nascens, nocte relucens. Signum hoc ejus, quo in tenebris decerpitur.” Nat. Hist. Lib. xvi. 13.

This beautiful *Polyporus* recurs upon the same site in several successive seasons, but in scantier mass and diminished vigour each year, till at last it appears to have absorbed from that particular tree all the nourishment available for its support. It was first described by Ray, and is undoubtedly, although he is in error as to that being Pliny's Fungus, the Agaric Styptique of Paulet, who compares the flavour to diluted spirits of vitriol. He says also that the smell, as well as the brilliant yellow colour, are carried off by spirits of wine. It is strongly purgative, according to the same experimenting authority. The growth is extremely rapid, which fact was observed by Sowerby, who says that after heavy summer rains, “it forms an imbricated mass, in a few days, of three or more feet in circumference;” he also mentions the walnut and willow as its habitats, and thinks that the ramose states are owing to its growing in deep shade; but with respect to this it may be remarked that parts of the imbricated masses are inclined, if very vigorous and their horizontal development is checked, to assume a branched form; over luxuriance is in that case the probable cause of this character being prevalent, as it is the reproductive portion, the pored hymenium, which asserts itself wherever there is no room for the expansion of a head, pileus and all. On a horizontal surface it is evident the branched would be the natural growth; several Agarics, lateral stemmed when protruding from the *side* of a stump, are found with central stems if produced on its *flat top*. *A. ostreatus* and *A. stypticus* are examples of this. Nothing can be more beautiful than this Aurora-tinted Fungus; the most dull must be struck with it, the most prejudiced admire it. On the question of utility, which is sure to be asked—that it is not fit for table use we need scarcely state, but it need not therefore be condemned, being probably not more poisonous than medicinal things in general. Whether in that light it be worth attention, we leave to wiser heads.

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<sup>1</sup> Præcipue larices, oculato teste Nic. Chorier. lib. I. hist. Delphin. p. 58. Sunt enim ea regione plurimæ. Harduin, in *Plin.* xvi. 13.







A.M.H. del.

*Agaricus laccatus Scopoli*

Reeve, Britton & Reeve, Imp.







## PLATE XLVII.

AGARICUS LACCATUS, *Scopoli*.

## Series LEUCOSPORUS.

## Sub-genus CLITOCYBE.

Sub-division ŒSYPH.<sup>1</sup>

*Spec. Char.* AGARICUS LACCATUS. Pileus from one inch to two inches broad, convex, the centre more or less depressed, in age often cracked or squamulose with a mealy appearance, subcarnose, brownish red, flesh coloured or bright amethyst, turning pale when dry, margin incurved, often very much lobed and waved. Gills more or less of the colour of the pileus, subdecurrent, distinct, distant, horizontal, broad behind and adnate, thick, sometimes forked above, mealy from the white spores. Stem from one inch to six inches long, elastic, thickest and downy below, fibrillose, tough, hollow, of the same colour as the pileus but not becoming pale.

AGARICUS laccatus, *Scopoli, Fries, Schæffer, Berkeley, Greville.*

———— rubellus and carneus, *Schæffer.*

———— farinaceus, *Bolton, Sowerby, Withering.*

———— amethystinus, *Bolton, Sowerby, Withering, Greville.*

In woods, shrubberies, &c., from June to November.

The name of *Laccatus* was given to this pretty Agaric from the strong tinge of colour, resembling that of gum lac, which more or less pervades the plant; our drawing is taken from that variety of the species which several authors have described as *A. Amethystinus*, its garb being a lovely lilac purple. If the most opposite specimens of the two kinds of *A. laccatus* were selected and placed together while in fresh beauty, few ordinary persons would believe them to be the same species; although they might allow the close resemblance in the characteristic of form, independent of colouring; so far as the latter quality goes the difference would be startling. One appears of a rich laky buff hue, perhaps edged or tinted with red, but never with purple, and is more generally of the uniform clear self-hue, the base of the stem only being relieved by white down; the other is of a uniform self-colour also, and is also relieved by a white downy base to the stem, its tincture, however, is pure pale violet or amethyst; these are the extremes, but colour is an accident, not a fixed attribute; lay them side by side for a day, and in the fading of their beauty they acquire mutual resemblance. The development of the white abundant spores has dimmed the gills of both,

<sup>1</sup> From *οἰσύπων*, *dirty wool*; alluding to the more or less scaly opaque epidermis. Pileus dry, minutely squamulose. Gills generally arcuato-decurrent, seldom adnate.

the surface of the pileus in drying has changed grievously; the purple has flown, the laky-buff is off too, a couple of dull dowdy, buffish-purplish, or brownish individuals remain.

“All that’s bright must fade,

The brightest still the fleetest,”

and certainly there are not many instances in which the alteration is more striking than in *A. laccatus*; in a few hours the specimens, hoarded to exhibit as “so lovely” to some fellow-student, are sought for, and who could have anticipated the change? Provoking, too, if wanted for the pencil. In the accompanying drawing the prostrate one only has any pretension to perfection, the others are already “*passés*,” having lost their pristine beauty before so fugitive a thing could be transferred to paper.

We have supposed a case of extremes above, but there are many intermediate states of *A. laccatus* which soften down the glaring difference between them; nothing can prove, however, how apparently different examples may be, than the fact that Withering has described this one fungus under three or four names. The title “farinaceous,” which Bolton and others have given to this Agaric, is suggested by its powdered mealy appearance when the abundant white spores are developed; not from the smell of flour, although that has been supposed; it has no decided scent of newly ground meal, like *A. Georgii*, the *Orcella*, &c. In ordinary cases the smell is not remarkable, but once a quantity of the amethyst variety was collected, which had a very powerful odour of garlic when dried; the same species grew in very regular rings, not in close ranks like *A. Oreades*, but in small groups consisting of three or four, at distances of an inch or two apart, but these patches preserving an annular figure as a whole.

It is probably innocuous, though not tempting enough to have hitherto induced us to try its qualities as food; there is no notice of its being used in any work on Agarics. When water-soaked the youthful Amethystinus looks nearly black, and the buff kind, orange-lake; attention to this fact of being saturated with moisture, or the contrary, must be paid in all examinations of species, and due allowance made for change of colour or consistence accordingly.

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F. R. del

Reeve, Benham & Reeve, imp.

*Agaricus cristatus, Batsch.*







## PLATE XLVIII.

AGARICUS FUSIPES, *Bulliard*.*Spindle-stemmed Agaric.*

Series LEUCOSPORUS.

Subgenus COLLYBIA.

Subdivision STRIÆPODES.<sup>1</sup>

*Spec. Char.* AGARICUS FUSIPES. Densely tufted. Pileus from one to three inches or more broad, but only a few members of the group attaining full proportions; fleshy, loose, tough; when young, hemispherical or broadly umbonate; cracked, sometimes tessellated, smooth, slightly viscid in wet weather, dull vinous-brown or buffish, marked with dark patches as if burned; margin incurved, then expanded, acute; flesh white. Gills pale umber, free, or only apparently adnate from the form of the pileus; broad, distant, flexuous, serrated, connected by veins, with a watery appearance, though really dry, like a piece of half-dry parchment. Spores white. Stem from two to six inches long, from half an inch to an inch thick, ventricose, fusiform, irregularly compressed, above paler than the pileus, below dark red-brown; external coat cartilaginous, striate longitudinally, not truly though apparently fibrillose, often split longitudinally with transverse cracks, these cracks extending only through the cartilaginous coat; stuffed with shining, crisped, white fibre; in age hollow. Flavour and smell of Champignons, esculent.

AGARICUS fusipes, *Bulliard, Fries, Berkeley.*

— crassipes, *Schæffer, Sowerby, Withering.*

*Hab.* In dense fascicles, at the roots of oak-trees, after electric rains, during the whole summer.

If carefully dried, *A. fusipes* can be kept for some time, to enrich gravies, etc. It is remarkably free from insect larvæ, the texture being apparently too tough to please them, and for this reason it cannot be recommended as a stew, notwithstanding the agreeableness of the flavour, as it is not an easily digested substance: small compact individuals soften completely in vinegar, and may be recommended as a pickle to those who like such condiments. At some periods bushels of this Agaric might be collected within a small circuit at Hayes Common; and near Wymondham, in Norfolk, a line of trees were each surrounded by tufts of the not very ornamental brown fungus: it does not yield good ketchup, which is a pity, since it abounds when mushrooms are not to be had. The same sites produce crops of it year after year. When heavy summer rains have penetrated through the foliage, it may generally be found; but never at the

<sup>1</sup> Stem stout, sulcate, fibrilloso-striate, hollow or stuffed with spongy pith.

roots of any trees except oak ; dense tufts being squeezed tightly up between their gnarls and the soil, so that only the strongest and most vigorous heads obtain room for the expansion of their hats, which are flapped and bent in the struggle for place and precedence. The fibre which stuffs the stems is very beautiful, like spun-glass or floss-silk, when split longitudinally. We have counted nearly fifty Agarics composing one group, compressed together, and all but confluent into one stem at the base ; of course many of these were very small. In the growth of most plants, if the fully-developed members of a family were removed, the smaller would succeed to their place ; but in Agarics it is not so—all appear to be the consequence of one start in production, and those stunted at the beginning remain so after the strong ones have been removed. When favourable circumstances bring forward a second tuft from the original base, none of the prior crop help to compose it—they disappear entirely, to be entirely replaced after a pause.

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F. R. del.

Reuss, Penkner, & Dreyer imp.

*Agaricus psittacinus*. Schaeffer.







## PLATE XLIX.

AGARICUS PSITTACINUS, *Schæffer*.*Parroquet Agaric.*

Series LEUCOSPORUS.

Sub-genus CLITOCYBE.

Sub-division HYGROCYBE.<sup>1</sup>

*Spec. Char.* A. PSITTACINUS. Pileus one inch broad, conical, campanulate, at length expanded, sometimes concave from the margin turning up, smooth, glutinous, striate when moist, green at first, changing to yellow of various shades, sometimes tinted with lake red, often cracking. Gills slightly adnate, rather distant, broad in the centre, bright yellow often shaded with green. Stem from two to three inches high, about two lines thick, hollow, splitting, green, yellow at the base, very shiny.

AGARICUS psittacinus, *Schæffer, Fries, Berkeley, Greville, Sowerby, Withering.*

———— chamæleo, *Bulliard.*

In pastures and parks; October and November. Common.

“The green colour here seems, as in the *A. æruginosus*, to be contained in the slimy coating, which being laid on a golden ground, acquires such an unusual brilliancy. It wears or washes from the central and projecting part of the pileus, and then shews the yellow ground, but it remains longest on the upper part of the stem, because there protected by the shelter the pileus affords.” It would not be easy to amend Withering’s graphic description and therefore we offer it as it stands. Some years ago, when wandering through Knowle park, the turf was so completely sprinkled with these little gems of funguses, that it would scarcely have been possible to find a square yard of it which did not exhibit several; they are not lovers of umbrage, like many other Agarics, but prefer open sites, seldom growing under trees. This Agaric is of no use whatever, that we can recommend it for, neither does it possess deleterious qualities to be warned against, as far as our own experience goes. No attempt has been gastronomically made upon it at Hayes; in fact there is so little to say on the subject, that the bringing it forward at all seems to need the only excuse that perhaps mother nature can offer for its existence—“it is very pretty,” and this we believe every one will acknowledge whose attention is once directed to it; but it prefers that damp autumnal state of things, when the heavy half freezing dews never rise from the grass all day, when the weather is very questionable, when a lady’s gown may be better employed than in sweeping up dead leaves, and her foot

<sup>1</sup> From *ὕγρὸς moist*, and *κύβη a head*. Pileus thin, viscid when moist; stem hollow.

instinctively turns into the beaten track away from all these petty difficulties : still, if in their rambles, any of our friends meet with these elegant green "toadstools," they will not think *Agaricus psittacinus* less lovely for appearing when there is so little that is ornamental left.

It will be at once distinguished from young specimens of *A. æruginosus* by the colour of the gills, which are bright yellow in our Parroquet Agaric, and pallid umber in the other, and young specimens only before the spores are ripened could be liable to be mistaken for it, since the spores of *A. æruginosus* are dark, those of *A. psittacinus* white.

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Plate I.



E. B. del

Reve, Benham & Leve imp

*Agaricus variabilis* Persoon.







## PLATE L.

AGARICUS VARIABILIS, *Persoon*.*Variable sessile Agaric.*Series DERMINUS.<sup>1</sup>Sub-genus CREPIDOTUS.<sup>2</sup>

*Spec. Char.* AGARICUS VARIABILIS. Pileus from half an inch to an inch broad, membranaceous, at first hemispherical with a short stem, soon resupinate and then again reflexed, the stem becoming quite obsolete, white, covered with silky down; sometimes there is no stem at first, but the pileus is resupinate from the earliest stage of growth. Gills white, changing to reddish-white, with a buff tinge. Spores rusty-pink.

AGARICUS variabilis, *Persoon, Fries, Berkeley, Greville.*

———— nivens, *Sowerby.*

———— sessilis, *Bulliard, Withering.*

*Hab.* On sticks, stalks, and leaves in woods and hedges, more or less the whole year. Common.

There are several Agarics which begin life as this does; first turning down, then facing upwards till they lie on the back (resupinate) and ultimately curling over downwards again, in old age and a state of collapse. We have selected *Agaricus variabilis* as an example, because it may easily be recognised, and is not uncommon; it affects particular districts however, as many funguses do. Withering says, he saw it for the first time “sent out of Bucks” to Edgebaston near Birmingham, where he resided; and we may conclude it was scarce in his own particular district, or it would not have eluded so industrious an investigator. Although in Bucks it may be found in every hedge, in Kent it is not frequently met with. It is a very delicate pretty little thing. Mr. Berkeley notices that the cellular tissue is a beautiful microscopic object, but requiring a high power. The change in the colour of the gills is of course owing to the ripening of the spores, which are a buff pink colour; this will effectually distinguish it from *A. stypticus*; and that, moreover, is of a uniform buff hue; attention to the spores will prevent its being confounded with any other member of the subgenus *Pleuropus* to which *A. stypticus* belongs, that being a class under *Leucosporus*, which it seems almost impertinent to repeat so often, means having white spores or dust. Of the members of its own family, *Crepidotus*, which being under *Derminus* have coloured spores, ferruginous, reddish, &c., none appears likely to be mistaken for it; *A. rubi* grows on sticks, particularly as its name imports on the bramble, but the pileus is yellowish livid grey not snowy white, and the gills are darker.

*A. mollis* has umber gills, and is of a very watery substance at first. *A. pannuoides* has yellow gills, and a pileus tinged with violet, it is also very much larger. These are all the *resupinate* and *side-footed*

<sup>1</sup> From δέρμα, *skin* or *membrane*. Veil not arachnoid. Spores ferruginous.

<sup>2</sup> From κρηπίς, a *slipper*, and οὖς, an *ear*. Veil very thin, fibrillose. Pileus unequal, excentric or lateral. Gills unequal, changing colour. Spores subferruginous, subargillaceous, or reddish.

Agarics with which it appears probable our present subject should be confounded; many Agarics besides *grow on sticks*; but they are white-spored or have stems; there is one called *Ramealis*, the *Stick Agaric*, possessing both these points, so no other difference need be cited. Sticks indeed—dead rotten sticks, such as poor old hags fill a ragged apron with to boil their tea-kettle, are not the despicable things that many imagine; it would probably be impossible to pick out one which should not be garnished with some species of fungus life; some possessing exquisite beauty, all exquisite contrivances for self-development and propagation and the task they have to fulfil, the disintegration of dead wood. The poor never look grudgingly at a basket of “savory meat” in the Toadstool form; they would not eat, so do not envy them to the collector; but we have felt rather ashamed of ourselves, as, exultingly bearing a cargo of “sticks” picked out of ditches and banks in a Norfolk district where fuel is scarce, we met other “collectors” of that species of treasure, who never dreaming of the nearly invisible *Spherias*, and a hundred other beautiful creations with which they were studded, undoubtedly thought we might have left such gleanings to kindle (they call them “kindlings” in Norfolk) a blaze on the hearth of poverty.

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A.M.H. del.

*Polyporus perennis*. Linn.

Reve Berthou & Reve. imp.







## PLATE LI.

POLYPORUS PERENNIS, *Linnæus*.*Perennial Cinnamon Polyporus.*

*Gen. Char.* Hymenium concrete with the substance of the pileus, consisting of subrotund pores, with thin simple dissepiments. Name from *πολὺς*, *many*, and *πόρος*, *a pore*, in allusion to the many pores of the hymenium.

*Spec. Char.* POLYPORUS PERENNIS. Pileus from one inch and a half to four inches broad, coriaceous, velvety, zoned, cinnamon, varying in depth of colour; cup shaped when young, nearly plain when old; often confluent, marked with little raised radiating lines, giving it a striated appearance, margin fimbriate or laciniated. Pores minute, roundish or angular, at length torn, decurrent; of the same colour as the pileus, darkening in age. Stem from one to two inches high, varying greatly in thickness, bulbous at the base, very tough, velvety, cinnamon brown.

POLYPORUS perennis, *Fries, Berkeley, Greville*.

BOLETUS perennis, *Linnæus, Withering, Persoon*.

———— coriaceous, *Schæffer, Bulliard*.

———— fimbriatus, *Bulliard*.

*Hab.* On the ground in sandy places, or peaty soil in woods under trees, and among heather. Autumn and Winter, remaining through the following Summer in a growing state.

The affinity of this subject would at first sight appear to be with the central stemmed pored funguses properly designated “Boletus;” on pulling *P. perennis* to pieces, however, the tubes are found to be *formed out of the same tough substance as the coriaceous pileus*, which is very distinct in consistence from the soft-fleshed family. There are several of the Polyporus tribe possessing, like this example, a stem, central or lateral, which true stems must not be confounded with those “sportive” attempts to create such pedestals for themselves, which *P. versicolor* and its congeners now and then indulge in, and which are merely prolongations of the pored substance, often formed upon a stick or similar supporting nucleus. We have before explained that *endurance* for a period of several years, is not being truly *Perennial*; the conditions of which are *continuous development* for a period exceeding two seasons. All the specimens we have ourselves examined of *P. perennis*, appeared merely *Biennial*, growing for two seasons only, the first in a depressed *Peziza*-like form, the second expanded, waved, and turning over; after that, remaining still on their site, they do not decay, but fade, become weather-beaten, losing their richness of colour and soft velvety texture, while the margins acquire a jagged or fimbriated condition. Variations in the synonymes of the plant are owing doubtless to the different ages at which it has been observed and described. The coriaceous pileus becomes crisp and rigid in dry weather, and swells again in wet. Under trees, among their dead leaves, it may often escape attention, closely resembling them in colour; if this be the case, it is

nevertheless not a common Fungus, nor one easily mistaken. It does not grow upon stumps, fallen branches, &c., as so many of the rigid division of the Polyporus tribe do, which circumstance will alone serve instantly to distinguish it from most others. The accompanying drawing was made from a *Polyporus perennis* more than usually handsome, and larger than any which authors have hitherto described; many as fine occupied the same slope of peaty sand, covered by tall heath, under a dense umbrage of old oaks. The spot has been cleared a good deal, and we have since sought our friend in vain.

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Plate III.



ANCH. del.

BECK, BENHAM & BERRY, imp.

Polyporus Quercinus . *Fries.*







## PLATE LII.

POLYPORUS QUERCINUS, *Schrader*.*Oak-tree Polyporus.*

*Spec. Char.* POLYPORUS QUERCINUS. Pileus at first soft, fleshy, very thick, tongue-shaped, subspatulate, or triangular; pallid buff, or white, turning red in patches when handled, granulate; pores very minute, short, the same colour as the pileus. In mature growth the pileus expands beyond the dimensions of the thick horizontal stem, but remains more or less spatulate, plano-convex, dull yellow, the floccose upper surface reddish brown. The substance is elastic, corky, vinous when cut, the tubes darker. Intensely bitter.

POLYPORUS quercinus, *Schrader, Fries*.

———— suberosus, *Krombholz*.

*Hab.* On decaying oaks. Very rare.

“This polyporus was first described by Schrader, in 1794, but has since been lost sight of till very lately,” thus wrote Mr. Berkeley on receiving it from Hayes Common two years ago. Schrader noticed its resemblance in growth &c., to *Fistulina hepatica*, and this was fully borne out by an accident which destroyed some specimens of much finer growth than those depicted.

A basket-full of *Fistulina hepatica*, the “Langue de Bœuf,” had been collected and devoted to sauce, for which these funguses were constantly employed; the cook salted them down in the absence of her mistress, concluding the *white tongues* were only delicate varieties of the red, owing to a shady place of growth or some such cause. These “white tongues” were of considerable size, perhaps a foot long and not quite so wide. Next morning the salt had turned them brilliantly yellow, and it was evident that a mistake had been made,—an unfortunate one, for no examples so large and well developed have ever been met with since; and it need scarcely be stated that they did not make good sauce; their bitter flavour is intense, like galls; yet the same tree, at the same time, produced also the bland *Fistulina hepatica*, which is slightly acid but never bitter, and always retains the flesh-like juiciness of its texture, when its Polyporus neighbour has hardened into excellent cork, whence its other name “suberosus.” Funguses, therefore, “each after its kind,” can select and modify for themselves the nutriment they draw from the tree, as the deadly hemlock and emollient mallow grow side by side on the same soil in which the chemist would vainly try to detect differing qualities. The genius to solve these difficulties has not yet arisen, it must be a greater than Ray or Linnæus to do it; in the mean while whatever ground has been gained in late times, is disencumbered of the rubbish left by “ingenious gentlemen,” who surmised where they could not fathom, and imagined where they could not see; no theory now-a-days can stand unless upon a firm foundation; people observe, they dare not venture to speculate; and when a sufficient number of “facts” shall have been accumulated, possibly the mystery of the propagation and germination of Funguses may be deduced from them by a skilful generalizer, and the mode in which plants select their food discovered.

The selection of food by insects and animals is in some cases remarkable. Snails chose to eat *P. quercinus*, bitter and hard as it was, while soft-fleshed Agarics were at hand; this was owing to no want of the powers of discrimination, for the long heavy slugs would crawl up a brick wall to feast on the most offensive and disagreeable of Agarics,—*Melleus*, (honey coloured, not honey flavoured good reader,) and if they could detect the strong foxy scent, they must also have appreciated the flavour, for a banquet on this, the “Têtes de Méduse,” was certainly ambrosial in slug estimation, and great was the labour and exertion they employed to get at it, although food, we should have selected if catering for them, might have been had without any pains. Whatever qualities our present subject may possess, is, perhaps, of little importance since it is so very rare, that to recommend it would be to tantalize. In its white and most luxuriant form it has some resemblance to *P. betulinus*, but that is not bitter and does not turn so yellow in age. *P. quercinus* is never zoned; the growth being more vigorous at some periods than at others, causes it to swell and contract in outline as the plate shews. Little nodular pieces of various Polyporuses may resemble it in a youthful state; but one test seems as if it might be depended upon—taste. Is it bitter?—as gall. Then it is, if other particulars do not forbid, *P. quercinus*, we know of no other of the family having this quality: *P. Dryadeus*, growing at the foot of oaks, certainly has not, being only sub-acid.

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Plate LIII.



F. R. del.

Leave, Braham & Rose imp.

*Exidia Auricula* - Judæ. *Linnaeus*







## PLATE LIII.

EXIDIA AURICULA JUDÆ, *Linnaeus*.*Judas's Ears.*

*Gen. Char.* Receptacle margined gelatinous tremulous distended homogeneous, covered above only with the hymenium. Spores at length bursting forth elastically. Name from Exudo, to *exude*.

*Spec. Char.* EXIDIA AURICULA JUDÆ. Sessile, concave, distended, flexuous, venoso-plicate without and within, beneath subtomentose, olive cinereous or reddish brown; the upper substance corrugated, the plaits branching from the middle part where they are deepest, and somewhat convoluted, so as to give an idea of a human ear.

EXIDIA auricula Judæ, *Fries, Berkeley*.

TREMELLA———, *Linnaeus, Persoon*.

PEZIZA auricula, *Linnaeus, Bulliard, Withering*.

*Hab.* On living elder trees; seldom on any other. Early autumn and winter.

In a former notice of the *Exidias*, while describing *Exidia glandulosa* in particular, the main difference was pointed out between that sub-division of the tribe *Tremellini*, and another subdivision, *Tremella*, in the restricted sense of the word. The present subject differs greatly from *Exidia glandulosa*, having much more substance; it has the appearance of a confluent mass of *Pezizas*, each ear-shaped cup being deep with well-defined margins, often connivent or bending inwards, always collapsing in that direction in old age or when drying up; whereas the thin gelatinous membrane called “witches’ butter,” falls laxly outwards, concealing the inferior surface. For this reason everybody will at once understand, when the hymenium of *Exidias* is stated to be on the upper surface only, in contradiction to the sac-formed marginless *Tremellas*, which have it all over them, that it is the shining, black, papillate side of the membrane, always uppermost, and often convex, in *Exidia glandulosa*; in that example, mistake cannot be. In the *Exidia Auricula Judæ* the case is different, the said “superior” hymenium being the lining of the cup, which the ignorant might suppose “inferior,” when the outside closes pretty nearly over it, as in a very dry state it often does. It has been remarked that “when growing on a perpendicular tree the plant turns upwards:” this *E. glandulosa* does not, and the papillæ so distinctly visible on its hymenium are wanting in that of Judas’s Ears. That is the correct name, not Jew’s Ears, as commonly given. There is an ancient tradition that it was upon an elder tree Judas hanged himself, and that the fungus sprouted out in consequence: the authority for this has escaped our memory, but a friend, whiling away a wet day, unexpectedly came upon a corroboration of this legend in the last place a lady’s research was likely to have invaded:—

Sallades cent diuersitez, de cresson, de hobelon, de la couille á l’euesque, de responses, d’aureilles de Iudas (c’est une forme de fungus, yssans des vieux suzeaulx).—Rabelais. Pantagruel, Liv. iv. Chap. lx.

But for salad, Monsieur Rabelais, excuse our faith in its ever being either salad or pottage; it may be esculent, we should not like to try, always making very certain indeed that others have sufficiently risked experiment and given their sanction "let it be eaten," before we venture: then and not before, *we eat*, and if satisfied that we can do so honestly, *recommend*. It would appear from the old herbalists that this fungus possessed or was supposed to possess the same virtues as the tree it grew upon; green elder being a nostrum for many things, and the ointment from its leaves, as well as the flowers, still finding a place among medicaments. Gerarde says that boiled in vinegar the Ears of Judas are a cure for sore-throats; probably the gelatinous quality of the plant corrected the acrimony of the vinegar, thereby softening its rude effect.

If any of our friends should seek it, they must not expect to find anything like a human ear: making every allowance for the darkening effect of southern climate, it is much more like a bat's or some of the monkey tribe. The colour varies through every shade of brown to cinereous; in dry old age it is often beset with green Algæ, but this is no part of the plant and is common to many funguses. It shakes like any other jelly, when in the moist gelatinous state, but is not viscid; in dry weather it becomes rigid and the velvety pile harsh and rough, but after rains swells out again into the soft india-rubber-like quivering substance, which gives it a place among the *Tremellini*.

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F. R. del.

Reeve, Benham & Reeve imp.

*Lycopodium gemmatum Batsch var.*







PLATE LIV.

LYCOPERDON GEMMATUM, var. *Batsch*.

*Studded Puff-Ball.*

*Gen. Char.* Peridium membranaceous, with an adnate subpersistent bark, within furnished at the base, with a spongy sterile stratum. Capillitium unequal.

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*Spec. Char.* LYCOPERDON GEMMATUM, var. *Proteus*, Sow.

Peridium membranaceous, persistent, narrowed at the base, subrotund, covered with the mealy adnate bark and scattered subspinulose warts; stem elongated, somewhat plicate at the base. Flocci persistent, forming in the centre a columella; mouth prominent, umbonate from the conical columella. Spores brownish green.

LYCOPERDON gemmatum, *Batsch*, *Fries*, *Berkeley*.

————— *Proteus*, *Sowerby*, *Withering*, var. “*pestle shaped*.”

*Hab.* In fields, extremely common.

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This being but one among the Protean forms of our present subject, it seems as well to add the specific character of some others since the student could scarcely suppose them all to be the same *Lycoperdon gemmatum*, varying according to soil, situation &c., but having no real botanical difference.

“Peridium rounded, depressed, warts deciduous, compact with a firm mucro (dagger shaped), stem round somewhat scabrous.”

LYCOPERDON perlatum, *Persoon*.

————— hirtum and echinatum, *Bull*.

“Peridium turbinate substipitate rough with stout spinous rather distant warts.”

LYCOPERDON candidum, *Ic.* and *Desc*.

“Turbinate sessile, hairy, with thin soft at length generally blackish warts.”

LYCOPERDON umbrinum and quercinum, *Persoon*,

“Turbinate seldom spinulose furfuraceous with more or less dust-like warts.”

LYCOPERDON molle, *Persoon*.

“Subrotund sessile papillary furfuraceous, pulverulent.”

LYCOPERDON *Proteus*, var. *Withering*.

And so we might go on, for the above forms are not all that this variable fungus assumes, although quite enough to prove that *Proteus* is a very proper title for it; it is the common Puff-ball of pastures, often growing in large rings, and when the student picks up anything of the kind which is decidedly not the smooth giant *Lycoperdon*, it is probably this. *Lycoperdon pyriforme* grows in tufts upon decaying wood or on sandy sites, not grassy pastures, it never has warts, and this and its habitat will serve to distinguish

it from our *L. gemmatum*, which the pear-shape would not do, for some varieties of that are turbinate, and between the outlines of a top and a pear there is slight difference.

Of *Lycoperdon cælatum*, the sculptured or embossed puff-ball, we propose shortly to give a plate, when it will be immediately perceived that, unless in a very juvenile state indeed, the one cannot be mistaken for the other. The very large *Lycoperdon saccatum*, of which a drawing appeared in an early number, being covered with spinulous warts in its juvenile state, is much more like this variety of *L. gemmatum* than any of its other relatives are; but the rare *saccatum* has a different mode of bursting when ripe, it forms no mouth, nor any regular aperture, but the peridium decays and disappears, leaving the stem merely surmounted by the barren stratum which was the base of the ball. *L. gemmatum*, on the contrary, never emits its contents as an oozing liquid, but from the mouth on the summit they fly off in dust, and children call their receptacles, Devil's snuff-boxes.

And all that parade of synonyms is attached to a Devil's snuff-box! True, that is the peridium or receptacle; if we take out its contents the base is found to be considerably thicker than the sides; this base or barren stratum, in *Lycoperdon gemmatum*, is merely saucer-shaped, but in *L. saccatum* prolonged into a stem so large as greatly to exceed in its entire substance the ball placed upon it, and in *Lycoperdon gemmatum* is varied in many ways between the two extremes. *Bovistas* are as truly "puff-balls" as *Lycoperdons* are, perhaps more so, for they never have stems, their peridium being a mere sac, destitute of the barren stratum; but besides this difference and some in the membranaceous covering itself, the colour of the contents is different; blackish-brown or umber in *Bovista*, in *Lycoperdons* olive-yellow or greenish-yellow. The mass of contents is called the capillitium, from its being composed of hairs upon which the spores are placed.

For the rest, all of both classes are eatable, if selected before any change in the colour of the spores takes place; when cut across they should be snowy white, then served in white sauce, a more delicate fungus there is not. The praises of the giant of the tribe we have written before; Vittadini and Dr. Badham are agreed as to the excellence of *Bovista plumbea*, and we can only add, when you vainly seek button-mushrooms, and are deluded by *Lycoperdons*, do not kick them away or pelt them away in anger, but make them do duty as substitutes; they have not the flavour of *A. campestris*, but resemble small sweet-breads. *Probatum est.*

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F. H. del.

R. B. & R. imp.

*Agaricus micaceus*, var. *Bull.*







## PLATE LV.

AGARICUS MICACEUS, var., *Bulliard*.*Mica Agaric.*Series PRATELLA.<sup>1</sup>Sub-genus COPRINUS.<sup>2</sup>

*Gen. Char.* A. MICACEUS. Cæspitose. Pileus from three quarters of an inch to an inch or more broad, half-ovate, often more or less irregular from the dense mode of growth, membranaceous, strongly striate, almost plicate, squamuloso-furfuraceous, sprinkled with glittering meal, rufous, the umbo darkest, the margin cinereous, very thin; veil very fugacious. Gills attenuated in front, broad behind, ascending, attached above, at first pale, then umber, mottled with the dark brown-black spores. Stem two or three inches or more high, two lines thick, equal, hollow, brittle, squamuloso-pulverulent, the epidermis often cracked into little scales, very faintly tinged with red, attenuated upwards, the base downy, and sometimes assuming the appearance of a volva.

AGARICUS micaceus, *Fries, Berkeley, Bulliard, Withering.*

———— congregatus, *Sowerby, Purton, Withering.*

———— striatus, *Bolton.*

*Hab.* Near the roots of trees, bottoms of posts, on lawns in gardens, everywhere extremely common. From May to November.

The variety of *A. micaceus* now given is the least common form of the commonest of Agarics; usually it is shorter, more compact, not so strongly ribbed, and simply coloured with a uniform buff hazel tint; the specific characters given above are not to be found in every example, but are intended to embrace all the many varieties to be found between the two extremes, which could scarcely be considered the same species, if they were not united by a gradation of minute differences, while the main botanical characteristics continue unaltered. As a family the deliquescent Coprini are very distinct, but to discriminate individuals requires care; they are named from being for the most part produced, if not absolutely, upon dung, such as old hot-beds, &c., yet in situations very strongly manured; according to the richness of the materials supporting it, a given species will be more or less luxuriantly developed; many are extremely unsubstantial, fugacious, and fragile; others although at first possessing weight and solidity, speedily expand into a loose softened texture, melting of its own accord into inky ketchup, which is not however fit for culinary purposes.

<sup>1</sup> Veil not arachnoid. Gills changing colour, clouded, at length dissolving. Spores dark-brown or black.

<sup>2</sup> Gills free, unequal, thin, simple, changing colour, at length deliquescent. Veil universal, more or less concrete, flocculose, fugacious. Stem fistulose, straight, elongated, brittle, subsquamulose, whitish. Pileus membranaceous, rarely subearnose, when young ovato-conic, then campanulate, at length torn and revolute, deliquescent, distinct from the stem, clothed with the flocculose fragments of the veil. Fugacious funguses, growing in rich dungy places or on rotten wood.

*Agaricus micaceus* with its congregated host of neat brown caps may be seen after every heavy spring rain, everywhere, in gardens, on lawns, by the road-side; it seems not to approve a high temperature, during dog-days we may seek it in vain; but as soon as summer heat declines to the medium degree of spring, up starts the Mica toadstool, and recurs till frosts check it. It loves best situations where decayed wood lies buried, not growing immediately from it, like the tree Agarics, but nurtured by it as by manure, and finding the disintegrated portions a proper nucleus and screen for the tender threads of the cottony mycelium which is its first state, and which sometimes is so abundant afterwards, as to form round the base of the stem a covering almost volva-like. Some decayed portions of pollard elms had been buried as the foundation for a fernery, and there the Agaric the second year appeared in dense clusters, which became a perfect nuisance; every plant near being soiled by its deliquescence. Before every thunder storm the ground heaved up and cracked, for the sensitive fungus felt those electrical influences propitious to its growth; and pushed its thousands of brown heads into the upper world; that crop passed through its proper stages from the pretty compact pileus gemmed with the bright fragments of the veil, glittering like morsels of mica, (whence the name) to the stained spore-sprinkled remains of what had been a pure white stem, now crowned with a few ragged fragments of the deliquesced cap.

Then came another storm, another crop; for three years the process continued and after that ceased entirely, the wood probably having imparted all the nourishment this particular Agaric could derive from it. On another occasion seeing a considerable portion of a pasture turned brown in a remarkable manner, it was found on nearer approach to be a close mob of these same toadstools, pushing and shouldering, but utterly unable to obtain space for expansion, and so they perished, only a few in the outer ranks extricating their caps enough to open them. It was the space where a very wide hedge had been grubbed and where probably many small roots had been left, which was thus occupied, and that one growth seemed to exhaust the site, as it has never recurred.

So common a "toadstool" is a good study for the beginner, and may easily be found and identified; the most usual type we noticed at the commencement of the article, its hues are not yellow of the gamboge kind, but ochry, reddish-brown, and unber. It is of no use, and in some sites worse than useless, but appears to have no deleterious properties.

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R. B. & N. imp

*Agaricus velutipes*, Curtis.







## PLATE LVI.

AGARICUS VELUTIPES, *Curtis*.*Velvet-stemmed Agaric.*

Series LEUCOSPORUS.

Sub-genus CLITOCYBE.<sup>1</sup>Sub-division RHIZOPODES.<sup>2</sup>

*Spec. Char.* A. VELUTIPES. Cæspitose. Pileus from an inch to three inches broad, smooth, shiny, of a beautiful tawny colour, unequal, convex, expanded, fleshy, margin thin subtransparent. Gills ventricose, broad, scarcely adnate. The colour varying from pale straw-colour to buff-yellow. Stem from two to nine inches high, three eighths of an inch thick, incurved, velvety, rich tawny brown, paler above, often compressed and striate, fistulose. AGARICUS velutipes, *Curtis, Fries, Berkeley, Withering, Sowerby*.

———— nigripes, *Bulliard*.

*Hab.* On decaying wood, underwood cut down, stumps of trees &c.; through the whole year; extremely common.

Among the Agarics which defy the painter's skill, we must number *Velutipes*, and this with the more regret, because, if the drawing could have been half as pretty as the plant, it would have excited everybody's admiration. Queen Elizabeth objected strongly to shadows besmirching the fair beauty of her face, and what would the gills of *A. Velutipes* think of the black marks which defile as well as define them, under artistic treatment? they are so clear, so pure in hue—and that hue the most difficult of all to treat with purity, a pallid buff yellow, frosted with the white spores which give them delicate elegance, like shot-silk, yet totally devoid of gloss. To relieve this the stem is rich velvet, of a warm reddish-tawny colour, and the pileus, while compounded of both hues, differs in material from both, shining in satin array. We may suggest that this costume evidently requires powder, for no pileus is without it when the mass is imbricated, those above shedding their white spores on those beneath. At any rate, the painter who combines these given hues and materials in his next drapery will find a harmony of the quiet kind, matching yet varied—all suitable (the pun was involuntary): and if he relieves the draperies by cold greys, such as the bark which forms the background to our agaric, it will, in colour at least, be a very chaste and beautiful picture. On commons, among furze bushes that have been cut off for firing, and similiar gipsey haunts *A. velutipes* is correctly stated to be “everywhere plentiful;” but there are wide cultivated tracts of England where it

<sup>1</sup> From κλίτος, a *steep* or *declivity*, and κύβη, a *head*, pointing to the shape of the pilcus when young. Veil none. Pileus convex when young, not umbilicate, at length often depressed or infundibuliform. Gills unequal, juiceless, unchangeable, tough, variously fixed or free.

<sup>2</sup> From ρίζα, a *root*, and πῶς, a *foot*. Pileus fleshy, viscid. Gills sub-adfixed. Stem rooting.

rarely appears. It cannot possibly be mistaken for any other; *Agaricus radicans*, its near relative, is never caespitose, and has not a tinge of yellow in its whole composition. The velvet stem and white spores must be present, in which case if an Agaric possess a general tint of tawny yellow combined with those two characters, it can scarcely be any other species. Occasionally from the recesses of some old stump it stretches out an unduly lengthened fasciculus of stems, pallid from want of light, and distorted from want of room, so that its oldest acquaintance might be puzzled to recognise "the once familiar friend." But even such monstrous growths as this, a little caution about the colour of the spores, and attention to those *characteristics which in all Agarics are unchangeable*—the shape of the gills; the nature of the stem, whether hollow or solid; the way in which the gills are placed as regards the stem, whether decurrent, free, or emarginate; the presence of volva, ring, or curtain, all the particulars in fact which, belonging to the intrinsic nature of the species, will be always found *invariable*, despite the accidents of colour, and appear in a mere black and white drawing—these *unchangeable characteristics* must be looked to carefully, and then, although distorted, abortive things may be found, such as lead the tyro to conclude he has discovered something quite undetected hitherto, the mask will be pulled off as soon as anatomical examination is brought into play. It must be observed that masquerading Agarics, Boletuses, &c., &c., do not usurp each other's likeness, but are like nothing ever seen before. *Agaricus velutipes*, for instance, if acquiring a different character from its true type as an Agaric, will not, therefore, be mistaken for *A. caudicinus* or *A. fascicularis*, but puzzle the examiner as a new and undescribed species. Considering the rapidity of their development, the loose texture of their parts and the harsh substances, often conglomerated pebbles and entangled roots, through which they have to force a way, it is astonishing that things so soft and fragile should be as seldom distorted as they are.

Of the qualities of *A. velutipes* we are ignorant; it is not *bitter* as many yellow funguses are, but tastes agreeably and possibly may be wholesome for food, if the slippery quality it possesses be not objected to; for ourselves we honestly confess that the consistence of a slug is not agreeable to our palate.

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## PLATE LVII.

BOLETUS SCABER, *Bulliard*.*Rough-stemmed Boletus.*

*Gen. Char.* Hymenium distinct from the substance of the pileus, consisting of cylindric separable tubes. Name from *βολλος*, a *ball*, from the rounded form of many of them.

*Spec. Char.* BOLETUS SCABER. Pileus from three to seven inches or more across, pulvinate, viscid when moist; very variable in colour, whitish, cinereous, brown, olive, buff, bay, deep orange or vermilion; smooth or minutely downy, the down sometimes collected into minute fasciculate scales; flesh very thick, soft, white not changeable in young specimens, in older ones turning vinous grey when cut or bruised. The porous mass is pulvinate, extremely convex in age; tubes dirty white at first, then further discoloured and yellow-brown from the spores; minute, their orifices round. Spores dusky ferruginous. Stem at first ovate, and the pileus very narrow, with traces of the floccose veil; in maturity the stem is six inches or more high, attenuated upwards, squarrose with black or orange scales, or marked with fibrillose raised lines, sometimes perfectly white, but generally the fibrillæ are brown or black. Spores dusky ferruginous.

BOLETUS scaber, *Bulliard*, *Fries*, *Berkeley*, *Sowerby*, *Persoon*, *Greville*.

———— Aurantiacus, *Bulliard*, *Sowerby*, *Withering*.

*Hab.* In woods and woodland districts. Summer and autumn; extremely common.

In a fungus-hunting expedition recently, the two extremes of *Boletus scaber* presented themselves, and certainly it was difficult to persuade our basket-bearing tyro that the elegant, tall gentleman with enough black fibrillæ to set off the white of his stem, and the vermilion of his rich soft kid-leather cap, could be “own brother” to the swarthy, shiny, scabrous, very vulgar individual, we encountered afterwards. It was the difference, which has so often given subjects to the caricaturist, that between the dirty ruffian and the trim grenadier, and only on consideration how much under differing conditions the sons of Adam differ could the possibility of such fungus differences be conceded by the uninitiated.

Whatever his garb may be, it must be remembered no tinge of yellow, green, or blue, is under any circumstances present in this Boletus, the various tints of ochrey-red, buff, or brown pervade it; for even under its gayest colours, the name Aurantiacus is not apt—it is of a *mineral red*—a dull vermilion, not a dark orange tincture, like the mixture of yellow with lake. The common hue varies from dull buff to bay-brown; only the red variety has the smallest pretension to beauty, while the pores are yet unstained by the ripening spores, *that* is handsome, the size and colouring, and general effect are imposing. Another variety with a clean buff cap and snow-white stem on which the downy raised lines are quite destitute of dark scales or fibrils has several times been collected, and is, although not so specious as the Aurantiacus, a very good looking quaker of a toadstool. Both these are esculent when young, and not water-soaked by

excessive rains, on which condition much of the goodness and flavour of all the *Boletus* tribe depends; a firm specimen, selected before the tubes have changed colour, and insects begun their ravages, will be found very agreeable broiled; but the flesh softens in age to a consistence not pleasant, although there is nothing objectionable in the flavour or qualities. The fibrillose dark lines down the stem are peculiar to *B. scaber*; others are meshed with fine net-work or indented in strong reticulations, but not in this peculiar *linear* form.

If it should be mistaken for *B. edulis*, it is a compliment, as that is much better than itself; both might carelessly be confound with *B. felleus*, but as that dangerous individual is bitter when tasted, a certain test exists; other *Boletuses* beside these either turn blue or green, or have yellow in their colouring, so that confusion cannot well arise. *Boletus edulis* has the stem meshed closely all over with fine reticulation, has no red in its shades, never turns colour when cut, and the change of the tubes with age is from white to dirty yellow nearly olive, the spores being green olive. *Boletus felleus* has a broken cap, generally cracking into fine tessellations; the stem is paler brown, grooved deeply in a reticulate manner; the change of the tubes is from white to dull pink-red, the spores being rosy-ochre.

After studying these characteristics any one may ascertain *B. scaber*; like all other *Boletuses* these must have the tubes removed before being cooked, then if firm and intact, they may be filled with a little force-meat in lieu of the tubes, and gently roasted in a cheese toaster, or broiled, but not cooked in any manner which leaves them moist.















## PLATE LVIII.

THELEPHORA HIRSUTA, *Willdenow.**Common Buff Thelephora.*<sup>1</sup>

*Spec. Char.* THELEPHORA HIRSUTA. Effused, at first resupinate, at length generally reflexed, often imbricated, more or less zoned, coriaceous, but not rigid, strigose, buff, yellowish or greyish, fading pallid, and often acquiring a green tinge from the presence of minute Algæ. Hymenium smooth, even, buff, sometimes cinereous. Margin entire, more or less lobed.

THELEPHORA hirsuta, *Willdenow, Fries, Berkeley, Persoon, Greville.*

AURICULARIA reflexa, *Bulliard, Sowerby, Withering.*

*Hab.* On posts, sticks, fallen trees, &c.; very common.

The present plate presents the *Thelephora* in such a position as to show very little of it, except the buff hymenium; the smaller example gives the upper sides of two variously coloured pileuses.

It is of variable and fantastic growth, and may be found as half-a-dozen apparently different species in the scope of a very restricted examination; in youth and age it could scarcely be supposed the same plant. At first, small, yellow, obtuse dots and lines are seen which extending their growth become thinner, waved, plaited, and scalloped, and cover an old stick with ruffles from one end to the other; sometimes they shrink up, looking brown and dull, then after rain their margins swell again into bright yellow tumid lips, and every passer-by is attracted by the beauty of the Fungus meandering in ridges all over the old gate-post or decaying rail. This is during the period of youth; in mature age a uniform buff is the usual colour of the entire plant, and then changes of season and weather operate little upon the configuration of the substance, but bleach its hues till eventually it assumes even a "frosty pow," or puts on a wig of green parasitic Algæ. The resupinate form with which it begins causes the hymenium, smooth, velvety, and poreless, to be apparent only at first, then one edge of the pileus rises while that opposite continues firmly attached, and growth extends from that, as a base, perpendicularly to the substance on which it is placed; this attached edge cannot of course expand; therefore, the free portion, growing out, zone beyond zone, forms scallops, which are irregularly crowded, but all turn over one way, so that in one direction we see all the caps, in the other all their lining. It wears a hairy cap as the name denotes, tomentose, even shaggy, not often bedecked with coloured zones, but it is always a clean, elegant, attractive individual, and gives a foreign grace to many an innately graceless block.

A few years ago the picturesque summits of some pollard oaks were fixed in the garden to have creeping plants inserted in their cavities. The succession of Funguses upon those particular stumps was easily watched, and extremely interesting—firstly the present *Thelephora* and its cousin *T. rubiginosa*, had entire possession, and used their advantage so industriously that the bark could not be seen for the pretty

<sup>1</sup> Hymenium homogeneous and conerete with the pileus even, or papillate; named from *θηλή*, a *nipple*, and *φέρω*, to *bear*, from the papillose appearance of the hymenium in many species.

usurpers—their reign lasted two years; by the third, only a dwindling casual pileus was to be found, but *Dædalia biennis*, *Agaricus stypticus*, and various others took their place; *Reticularias* being the last to find a habitat on wood, channelled throughout by carpenter bees, and which is now held together by the roots of the plants placed in it. “Let us see what there is on the stumps,”—once sure to be productive of some Fungus or other, is a useless errand now, and we only regret that a register was not kept of the demolition of our wooden giants, Gog and Magog, by the united efforts of insects and parasites. Another stump, also oak, produced a plentiful crop of *Tremella fimbriata*, for one season, and never anything else; a fourth had the decayed spaces filled with *Reticularia umbrina*; and at that same period there was a kind of epidemic of them, notices being sent from various quarters of “a species of puff-ball” growing in ancient trees. If any of our friends should find this monster, a silvery brown or pure white puff, on decaying wood, it is *Reticularia umbrina*, having brown powder for its main substance, the sac which contains it being very evanescent; or it may be *Reticularia maxima*, externally snowy white, internally purple black.

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*Agaricus flexuosus*. Persoon.









## PLATE LIX.

AGARICUS FLEXUOSUS, *Persoon*.*Flexuous Milky Agaric.*

Series LEUCOSPORUS.

Sub-genus GALORRHEUS.<sup>1</sup>

*Spec. Char.* AGARICUS FLEXUOSUS. Cæspitose or solitary. Pileus from four to eight inches broad, crisped and waved, hard, rigid, and brittle, very irregular, in youth frequently folded inwards, often deformed and scarcely rising above the soil, in age infundibuliform, the margin very slightly involute; zoned, more or less ochraceous, viscid when moist. Flesh white, milk watery white, insupportably and instantly acrid. Gills nearly of the same colour at the pileus, but of a more rufescent tinge, in age they have a shot effect from the paler spores; very much forked and anastomosing, owing to the intermediate veins and irregular compression of parts of the pileus. Spores ochraceous not pure white. Stem short and thick, blunt, white, very minutely downy, though occasionally quite smooth, firm, generally solid, but in irregular specimens it has cavernous spaces in the substance.

AGARICUS flexuosus, *Persoon, Berkeley*.*Hab.* In pastures, under bushes. July, August, and September.

The Agarics, classed under the head Galorrheus or milk yielding, considered as a class, have white spores, but there are two or three exceptions, the spores of which when collected in a body shew a decidedly ochraceous tint; in all other respects, however, they conform to the particular characters of the division in which they are placed; and if the student should object to the arrangement of Agarics by the colour of their spores, because a few individuals are at variance with it,—the answer is easy, no rule can be absolutely free from exceptions, a cream or ochre cast is no material difference in the colour of spores taken as the test of a large class, which agree in all other botanical particulars, and in no case is the discrepancy of colour so strong as to cause confusion with other divisions. As a mode of distinguishing an individual with certainty, there is no test like the colour of the spores. The very Agaric under consideration is one of those that have the spores of a pallid ochre tint; but this pallid ochre or cream-colour is very different from the rich reddish ochre of the Cortinarius Funguses, the rosy-ochre of the series Hyporrhodeus, or the ferruginous brown of the series Derminus. It must also be remarked, that no Agaric has the spores white in one situation and yellow in another; it is the one fixed invariable point about them, that differ as they may under circumstances, though they may be distorted, diseased, and sportive in any other way, their dust when collected by reversal on a glass, is always precisely the same. The gills do undergo a change which renders them alone a fallacious guide in classification; many Agarics have been named and described twice over from

<sup>1</sup> From γάλα, *milk*, and ῥέω, to *flow*. Veil none. Stem naked, firm, sub-equal, diffused into the pileus. Pileus fleshy, firm, plano-depressed, umbilicate, margin even, when young involute. Gills unequal, often forked, narrow, attenuated behind, adnato-decurrent. The whole plant abounding with a milky juice. Large or middle-sized, persistent, frequently acrid Fungi, growing on the ground.

this cause; we all know the common Mushroom has pink, then chocolate gills, and the Cortinarius Agarics often begin with lovely lilac or even white gills, which in age become rich reddish-ochre, that being the colour of the spores when developed; the effect of one tint thus placed upon another is to give that changeable, shot-silk effect to the gills, which defies the pencil. In *Agaricus flexuosus*, although the spores are not pure white, they are paler than the membrane on which they are placed, full in front therefore, the gill shows its own hue most clearly; seen sideways the frosting of the spores gives it a pruinose effect like the bloom on fruit.

The example here given of *A. flexuosus* is more regularly shaped than it is often found; it sometimes attains much larger proportions, and becomes very irregular, large lobes of the pileus remaining curved inwards, unable to extricate themselves from the grass roots and other obstructions to expansion; ours grew where it got fair play, but even then it is not of the regular funnel-shape assumed by many of the tribe; it is viscid, retaining leaves, &c., sticking to it. The gills are frequently forked in a most complicated and elegant manner, and before the spores ripen have a redder tinge than the pileus. The milk is not rich and flowing bountifully, as in *A. vellereus* and some others, but scanty and "sky-blue;" nothing can exceed its acrimony that we have met with in the vegetable kingdom; capsicum is mild to it; spurge not so permanently painful. A young friend despite of warning, on tasting a morsel instantly started off on a race, which was so apparently objectless as to give painful doubts of his sanity; but he had descried a brook at a distance, and there we found him ten minutes after, still laving his burned tongue in the stream. It is due, however, to these very acrid Agarics, to state that unless the substance be swallowed the effect subsides entirely after some minutes; no soreness or blistering effect is produced; perhaps their acrimony most resembles the leaves of the Arum.

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A. M. H. del.

B. B. & B. imp.

*A. lateritius*, var. *Schaefferi*.







## PLATE LX.

AGARICUS LATERITIUS, *Schæffer*.

Var. SUB-SOLITARIUS.

*Red-brick Agaric.*Series PRATELLA.<sup>1</sup>Sub-genus HYPHOLOMA.<sup>2</sup>

*Spec. Char.* A. LATERITIUS. Gregarious. Cæspitose, but not densely tufted. Pileus from two to three inches or more broad, fleshy, plano-convex, always very obtuse, at length expanded, dry, nearly smooth, ochraceous, tawny in the centre inclining to brick-red, paler at the margin where it is slightly silky; when young it is silky all over, and in proportion as it becomes smooth, it is more deeply coloured. Flesh compact, white, bitter. Veil stained with the spores, adhering in fragments to the margin. Gills rounded behind, adnate with a tooth, from pallid nearly white, becoming dusky olive when clouded by the spores; spores pale brown-purple not with a ferruginous tint. Stem three inches or more high, from two to three lines thick; often thickest below, stuffed, firm, at length fistulose, but the walls are as thick or twice as thick as the diameter of the canal; yellow with a more or less rufescent tinge.

The variety *sub-solitarius* is often very handsome, the centre of the brightest brick-red with superficial patches of down, cracking, turning black where bruised or pressed against other substances; the stem is much thicker, stouter, and in young specimens the canal can scarcely be perceived, nearly of a uniform hue with the pileus, equal, but thickened at the base. Smell agreeable; flavour less bitter than that of the cæspitose variety, but not “sweet.”

AGARICUS lateritius, *Schæffer, Frïes, Berkeley, Persoon, Greville.*

———— amarus, *Bulliard.*

———— pomposus, *Bolton.*

*Hab.* At the foot of stumps, or where decaying roots are beneath the soil. From May to October.

There is a yellow Agaric with orange shades on the centre of the pileus, and green gills, which may be found at the bottom of nearly every old post and stump during a great part of the year; it is often so densely tufted as to have gained it the name “*fascicularis*” or “bundled-up” Agaric; between this and our present subject, the sub-solitary *Lateritius* so great a difference exists that they can never be mistaken for each other, but then these are two extremes. The more usual growth of *A. lateritius* is also fasciculated, although not so densely as that of its congener, the proper owner of the name, and weak, pale, specimens

<sup>1</sup> From *pratum*, pasture ground. Veil not arachnoid. Gills changing colour, clouded, at length dissolving. Spores brown, purple, or in the Coprinarii nearly black.

<sup>2</sup> From *ῥαβδος*, a *web*, and *λῶμα*, a *fringe*. Veil fugacious, woven, fixed to the margin of the pileus and stem. Stem firm, sub-solid, distinct from the pileus. Pileus fleshy, convex, then plane. Gills adnate, close, subdeliquescent. Cæspitose, growing on wood.

may be found much more nearly approaching, in outward guise, this humble ally, squeezing up to the gatepost to gain protection apparently from passing feet, than to the splendid "*Pomposus*" glowing in orange and red, throwing out a few bold stems to display their handsome caps, under the awning of the hazel boughs in the coppice, as if they thought the old stump should be flattered by their selection of it.

But there is one sure test, the colour of the spores; which in *A. fascicularis* are ferruginous-purple, in *A. lateritius*, pallid purple-brown without the slightest tinge of rust colour, exactly the shade of raw chocolate. There is little occasion to point out the difference between *A. lateritius* and its sub-solitary variety, it may be more difficult to prove their likeness. When the habitat of this Agaric is decaying wood *above ground*, seven or eight, seldom more, perfect pileuses proceed from the nidus in which they take birth, the wood on each side circumscribing their *root expansion* to one small spot; but when their rudiments find space for spreading laterally, as in the case of dead wood or roots *beneath the soil*, each pileus can force a way for independent existence and does so; then, instead of lax stems, lengthened to give room for expansion, and caps tiled one over the other, shedding their discolouring spores on the inferior ones, we have a stout, firm, clear-coloured Agaric, which strict examination will convince the sceptic is really *A. lateritius*, and nothing short of it will. We have found it on a lawn, of which the soil is full of roots from surrounding trees, growing in perfect rings of considerable diameter, which proves that the spawn has a tendency to spread where opportunity is afforded, and that our solitary friend is no misanthrope, but inclined to join the social circle in proper and pleasant places.

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F.R. del.

R.B. & R. imp.

*Agaricus coccineus*, *Wulfen*.







## PLATE LXI.

AGARICUS COCCINEUS, *Wulfen*.*Changeable Scarlet Agaric.*

Series LEUCOSPORUS.

Sub-genus CLITOCYBE.

Sub-division HYGROCYPE.<sup>1</sup>

*Spec. Char.* AGARICUS COCCINEUS. Pileus from one inch to two inches broad, at first convex, obtuse, conico-campanulate, afterwards expanded, depressed, at length inverted; sometimes strongly umbonate, splitting from the centre, yellow, orange or scarlet, viscid when moist, when dry pallid, appearing to the eye fibrillose but not really so, margin thin, more or less wavy. Gills broad, ventricose, wrinkled, thick, connected by veins, adnate with a decurrent tooth in depressed specimens, red at the base, yellow in the middle, glaucous at the edge, retaining their colour longer than the pileus. Stem one inch and a half long, three quarters of an inch thick, more or less hollow, subflexuous, smooth though apparently fibrillose, tough but easily splitting, scarlet above but always yellow at the base.

AGARICUS coccineus, *Wulfen, Fries, Berkeley*.——— scarlatinus, *Bulliard*.*Hab.* Extremely common among short grass in pastures and on commons. September to October.

This Agaric is often confounded with a much commoner and less agreeable species, *Agaricus conicus*, which abounds everywhere in autumn, but affects most the long wet grass of rich pasture, whereas the short sweet turf of the open down, exposed as much as possible, pleases *Agaricus coccineus*, which deserves a little pains to discriminate it from others, and when once the differences are pointed out, will easily be determined under any circumstances. *Agaricus conicus*, as its name denotes, is acutely conic, is placed on a longer, more slender fistulose stem, is more shining and juicy, striate from having less flesh, and on being broken or bruised turns greenish black; age likewise produces this effect, the entire plant darkening to a sooty olivaceous hue; indeed, in some situations it is always dull olive yellow without a tinge of red, but even should the scarlet of its cap rival that of the real *Coccineus*, the turning black will decide the question, as that is peculiar to itself among the Hygrocybi; its flavour is unpleasant, while that of *A. coccineus* is like Champignons, and its scent, when drying, resembles sweet vernal grass or wood-ruff. Another of this section, *A. ceraceus*, has no scarlet in its colouring, and although that tint may be bleached by exposure from the pileus of *A. coccineus*, it will always be found beneath its shelter, on the stem and gills. *A. puniceus* resembles a gigantic growth of *Coccineus*; it is rare. *A. miniatus* is another fungus, never viscid. *A. psittacinus* has green for its general colour; we have given its portrait, and need only add that no shade of green is ever found in *A. coccineus*.

<sup>1</sup> From ὑγρὸς, *moist*, and κόβη, a *head*. Pileus thin, viscid when moist. Stem hollow.

Fragile and cracking of their own accord, these pretty Funguses can scarcely be extricated from the turf in an entire state, nor handled without breaking. They swell very much in wet weather, and then the flavour and scent are deteriorated; we have never eaten them as a dish, but believe they are perfectly wholesome, and during a long stroll have found that raw, they were extremely agreeable, and to the hungry quite acceptable.

It seems almost superfluous to add, that the subgenus *Clitocybe* has neither veil of any kind nor volva, and therefore these scarlet *Agarics* cannot be confounded with any others of that colour, having white spores.

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R. B. & R. imp

A. M. H. del.

*Clavaria pistillaris* Tinn.







PLATE LXII.

CLAVARIA PISTILLARIS, *Linnæus*.

*Hercules' Club.*

*Gen. Char.* Receptacle erect, more or less cylindrical, homogeneous, confluent with the stem. Hymenium occupying the whole surface.

*Spec. Char.* CLAVARIA PISTILLARIS. Solitary, large, from six to twelve inches high, incrassated upwards, obtuse, varying somewhat in form; smooth, yellowish rufescent or dull orange, dingy brown in decay.

CLAVARIA pistillaris, *Linnæus*, *Fries*, *Berkeley*, *Bull.*, *Persoon*.

———— herculeana, *Sowerby*, *Withering*.

*Hab.* In shady woods, rare.

This, the well named Hercules' Club, is the type of the entire genus *Clavaria*, having suggested a designation which suits but ill the greater part of the family; some of them are like switches, others like bushes, not in the least resembling our idea of what a club should be, which being based upon the tremendous weapon of classic fame as the Greeks sculptured it, are exactly fulfilled by *Clavaria Pistillaris*; this latter title is retained because given by Linnæus prior to the more descriptive one, we may be permitted however to use that in English nomenclature, as it is adopted by our own botanists, Withering and Sowerby.

About a foot high is the extreme elongation of this *Clavaria*; when so tall, it is little swollen at the head, being merely, as it were, stretched out and unduly lengthened, from growing perhaps more deeply embedded in dead leaves &c. than other specimens which have a short contracted portion, a stem-like support to an inflated summit; these are such as Withering describes; he compares them to a pear; in general they greatly resemble a fig lengthened towards the base, but their configuration is variable; sometimes the upper portion is rotund, at others puckered in and swelling out again, yet never at any time having a head distinct from the stem, the whole plant is confluent within and without, from the very base, where it is gathered into a point. One character alone will prevent its ever being mistaken for any other English variety, the contents are a snow-white soft homogeneous cottony pith, rending easily from the base upwards, without any cavity whatever, though the pileus splits occasionally in age, at the apex. *Clavaria ardenia* is hollow. All the other simple *Clavarias* as distinguished from the branched, with which of course there can be no confusion, are fasciculate, or tubular, and of much smaller dimensions than *C. pistillaris*.

The colour is an ochraceous orange in youth; the base white with fine down; as the spores which are situated upon every part of the external covering, become developed, it assumes a peach-like appearance, at

<sup>1</sup> From *Clava*, a Club.

that period; wherever the touch rubs off the bloom-like spores, cinnamon-brown marks appear, being the denuded epidermis; this reddish-brown hue the whole plant of course assumes, if much and rudely handled, yet as the spores remain in the sheltered parts, a purplish clay-colour is given by their presence, and it seems as if much more variegated in hue than is really the case; the summit is always, even at the last, a richer yellow than the sides. It is extremely persistent and may be kept a fortnight after gathering, provided it is shut up in a vasculum with a little slightly damped moss. On compressing it, the substance is firm and elastic, not rigid, resembling a little stuffed bag of doe-skin leather; it grows laxer with age, but there is no tendency to deliquescent decay; the whole plant ultimately shrinks and wrinkles into a very small compass. It is not viscid at any period of growth, even when moist. Krombholz says it is esculent; in England the fact is of little importance, it is so rare that when found the last thing we should think of doing would be to devour it; the smell is not unpleasant, but the flavour is very bitter, and the cottony texture does not imply agreeable mastication. It is not the only bitter *Clavaria*: *C. Fusiformis*, the bright yellow one, is in some situations intensely bitter; Vittadini's opinion therefore that all *Clavarias* are good for food, must be taken with a qualification, and applies probably only to the *Coralloid varieties*. These grow in branched groups like marine productions much more than any of the usual woodland plants; after heavy rains in September, 1848, masses each proceeding from one thick-stemmed base, were gathered in the woods near Farnborough (Kent) which measured eight inches across; they consisted of innumerable ramified branchlets of the most delicate silvery violet near the base with snow-white extremities; to this elegant plant no pencil could do justice on a white ground, we therefore allude to it in this place as it cannot have one to itself: it is *Clavaria Coralloides*. *Clavaria Cinerea* resembles it in mode of growth, but is darker and less elegant; *C. Pratensis*, a common one, is buff-yellow, of lower growth, fastigate and tufted: these are all esculent, but the only one we can thoroughly recommend as worth cooking is *C. Rugosa*, which is little branched, sometimes not at all, white or nearly so, like wax, thicker above than below, longitudinally wrinkled, and the outline of its unbranched forms much resembling in miniature our *Clavaria Pistillaris*.

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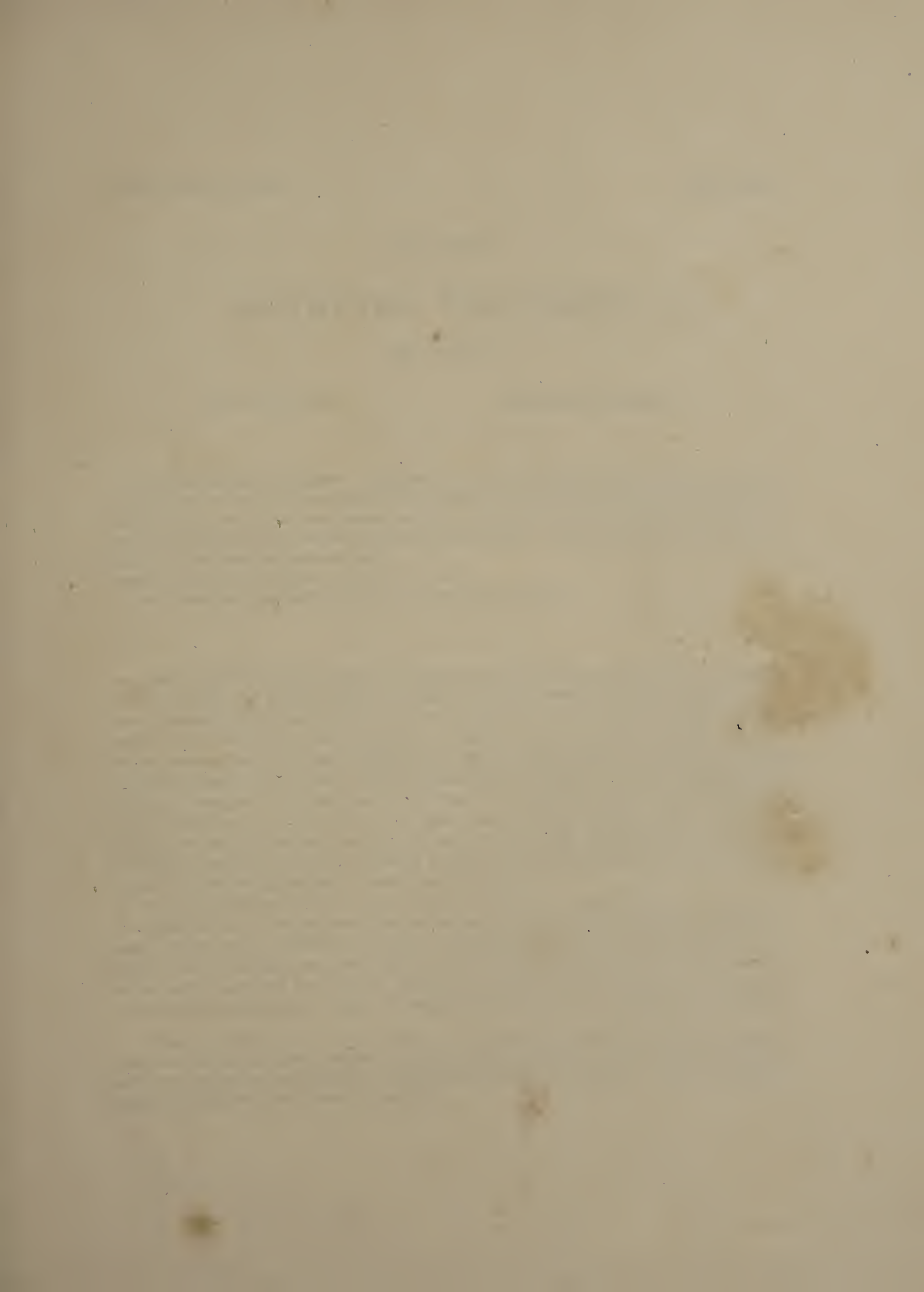




F. E. del

*Agaricus vellereus* *Fr.*

E. B. & E. imp







## PLATE LXIII.

AGARICUS VELLEREUS, *Fries*.*Downy Agaric.*

Series LEUCOSPORUS.

Sub-genus GALORRHEUS.<sup>1</sup>

*Spec. Char.* AGARICUS VELLEREUS. Pileus from four to seven inches broad, white, tomentose, rigid, more or less infundibuliform, margin at first involute, the whole surface minutely but densely tomentose, firm, fleshy; flesh-white, milk-white, acrid. Gills arched, distant, generally narrow, but in that respect variable, forked, connected by veins, at length slightly buff or yellowish, rufescent after being bruised. Stem one inch high, two inches thick, blunt, rather less downy than the pileus, solid.

AGARICUS vellereus, *Fries, Berkeley*. (*A. Listeri*, Sowerby).

*Hab.* Under trees, particularly oaks, in woods. July, August, September.

Which of the English milky Agarics is the species eaten under the name of *piperatus* on the continent, does not admit as yet of positive decision; the Italian and French peasantry call their funguses by local names, figurative and poetical enough, as “the Cow” and “the Goat” from their giving milk, and “peperone” and “poivré blanc” from the acrid taste of the milk; but when we seek to indentify these with the productions of our own soil, the conclusion come to after a wearying attempt to arrange the synonymes, is that these admirable “Cows” and “Goats” are not natives of our pastures at all, unless disguised under the sheep’s clothing of “Le Mouton blanc,” *A. vellereus*. This Agaric varies much, it has not often gills so highly coloured as the variety depicted in the present case; the name indicates a fleecy covering, but that is so close and adpressed that in age very little of it remains, except at the margin of the pileus; the pileus itself is commonly much eaten and defaced by slugs, it is zoneless and stained red in patches where injured, in this respect agreeing with *A. controversus* of Vittadini.

So large and common an Agaric, if good for food at all, would be very valuable; we have not as yet ascertained if this be the fact, having been thrown upon a wrong scent by the name *piperatus* applied to another English species, decidedly not esculent. It is often much easier to say what a thing is not, than what it is; the *Agaricus piperatus* of the English Flora, *A. acris* 200 Bulliard, is not the one eaten abroad, for we have cooked, tasted, and condemned it. None of the acrimony is lost in the process, and it acquires a most unpleasent bitterish taste; where the substance has been cut so as to allow the milk to flow,

<sup>1</sup> From γάλα, *milk* and ῥέω, to *flow*. Veil none. Stem naked, firm, sub-equal, diffused into the pileus. Pileus fleshy, firm, plano-depressed, umbilicate, margin even, when young involute. Gills unequal, often forked, narrow, attenuated behind, adnato-decurrent. The whole plant abounding in a milky juice. Large or middle sized persistent frequently acrid fungi, growing on the ground.

stewing turns it green; these two points, besides others, more particularly identify it with the Agaric described by Withering as *A. Listeri*, and which probably is the true plant of Lister; it has a smooth pileus whereas *A. piperatus* of Withering and Linnæus, our *A. Torminosus* and which is considered most deadly, is the “Mouton Zoné” of the French peasants, so called to distinguish it from the zoneless “Mouton blanc” which they eat; now as sheep, whether French or English, are fleecy, *A. vellereus* is clearly pointed out by their distinction, for it lies between two woolly individuals, not between a long-woolled and a shorn sheep.

Dr. Badham says “the *controversus* of Vittadini is the fungus which the peasants about Lucca eat under the name of the Lucchese Goat, it grows in great abundance in the chestnut forests of the environs. The milk which it pours out very copiously is white and in all its sensible qualities identical with the *Agaricus piperatus* of Scopoli and *Agaricus vellereus* of Fries. It resembles both those funguses very closely, but differs from the first in not changing to umber when bruised and in having the gills simple, very pale flesh-colour not white; from *Ag. vellereus* in not having a tomentum except at its border and in the colour, shape, and frequency of its gills; it is generally white, but sometimes with a yellowish tinge of epidermis, it soon becomes very pungent and not a little bitter, notwithstanding which unpromising antecedents, the peasants are not afraid to sup upon it grilled or fried with a piece of chestnut bread, and do not suffer. Somewhat uneasy at the extreme pungency of the milk, I have contented myself with tasting it; it loses all this pungency, however, by cooking.”

This *Agaricus controversus* we have not as yet found in England, and our readers will agree that there seems little to regret in the deficiency. Persoon describes *A. controversus* as the species most commonly eaten, being t. 538, fig. *c, d, e*, Bulliard. *Lactarius piperatus* of Fries is the *piperatus* of the Flora, vol. vi. *A. acris*, 200 of Bulliard. *A. Listeri*, Withering. The very first opportunity, our present subject *A. vellereus* shall be tasted, for though clearly it is not the “Lucchese Goat,” it may be the “Mouton blanc.”

“I should think Scopoli’s species is rather *A. vellereus*; whether any of these be the esculent species of the continent I cannot say; I suspect *A. vellereus*.”—*Berkeley*.

There is a large Agaric much resembling *A. vellereus*, but without milk, hence called *Exsuccus*; the gills of this are sometimes edged with a verdigris tinge which, and the absence of milky juices, will sufficiently distinguish the plant.

The difficulty of deciding on funguses of so very doubtful a character even to the experienced in such matters, will we trust discourage rash experiments on individuals of the genus *Lactarius*; particularly the pallid members of it.

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*Polyporus ulmarius*, Sow.







## PLATE LXIV.

POLYPORUS ULMARIUS, *Sowerby*.*Elm tree Polyporus.*

*Gen. Char.* Hymenium concrete with the substance of the pileus, consisting of sub-rotund pores, with thin, simple, dissepiments. Name *πολύς*, *many*, and *πόρος*, a *pore*, in allusion to the numerous pores of the hymenium.

*Spec. Char.* POLYPORUS ULMARIUS. Pileus between fleshy and corky, effused with an obtuse occasionally free margin; forming a new stratum every year, so that a vertical section gives several distinct layers of pores and flesh alternating with each other; zoncless, smooth, whitish; pores minute, tawny salmon-colour. Flesh white. Substance, when dry, hard and corky.

POLYPORUS ulmarius, *Fries*, *Berkeley*.

BOLETUS ulmarius, *Sowerby*.

*Hab.* On aged elms, often close to the ground. Biennial or perennial. Not common.

Sowerby appears to have been the first to notice this fungus, and he describes it so graphically, that no apology is needed for giving his own words: it would not be easy to improve upon them. "*Boletus ulmarius* may be found on old or rotting elms (*ulmus campestris*) thriving in damp weather most part of the year. It is a very solid, tough, unshapen mass, often very large, commonly attached by the back so as only to show the edge of the rugged pileus. The pores are very fine, frequently in many strata under each other of various lengths. I found a large mass spreading full three feet, last autumn, in the hollow of an old elm in St. James's Park, forming a grotesque kind of ceiling of different tints." On this text we may note, that Sowerby appears to have found the plant only when mature; the various layers of pores, indicating various periods of growth, prove this, as well as his speaking of its being "very solid and tough." In its first state it must be effused very rapidly, and is of so soft and juicy a consistency as to embrace grass, ivy, twigs; in fact every obstacle to its spreading is involved in its white downy substance, as it flows in undulations, like inspissated sap; in wet weather and in situations abundant in moisture, it attains a large size, without any determinate configuration; the salmon-buff pores are not visible at first, but a few form here and there as the substance hardens; then comes a fresh supply of moisture inducing a fresh formation of pileus, again hardening and forming pores, and so it goes on; two or three increments take place in one year, guided entirely by the moisture afforded, the entire period of growth is perhaps extended through several years, but the particular portions of pileus first developed grow dry, pallid, are covered with green Algæ, and are in fact only skeletons, inert and lifeless; a gradual decay takes place; therefore, although the mass is perennial, the growths composing it are annual, for they are not in perfection for a longer period. In Kent, where elm is the weed of the soil, and the hedge-rows are often composed of it pleached, the old stools afford frequent specimens of *P. ulmarius*, where repeated wounds of the hedge-bill cause the sap to

flow; in such places it runs out over the bank among the sticks and weeds, and would puzzle the tyro greatly. Soft as it looks, it is after a time extremely tough, and you can quite as easily divide the wood it grows from, as itself. Occasionally, when produced higher up in trees, the pileus is very compact, rounded in a dimidiate style, with smooth buff margin, bright bay pileus, and most minute pores of a hue rather redder than nankeen, particularly clean and delicate. The mass of pores is never plane, but swelling in gentle protuberances. The smell of this Polyporus is disagreeable. Perhaps it would make Anadou; Fries places it among the Fomentarii; the corky inner substance is at all times pure white. Its rarity is its great recommendation to the Mycologist. With regard to our portrait we have a word to say; a critic, a better judge of art than of fungi, objected to the drawing that it is uncertain and "*indistinct in character*;" as that is precisely *the character* of the Polyporus, it is complimentary instead of the reverse; but as other criticisms of the same kind may be made, this fact is stated in order to meet them.

The colouring of Sowerby's figure is quite improper, but the outline (his own performance) correct; he seems to have had very ill luck in his colour in several instances, even allowing for fading &c.

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*Fistulina hepatica, With.*







## PLATE LXV.

FISTULINA HEPATICA, *Withering*.*Liver of the Oak.*

*Gen. Char.* Hymenium formed of a distinct substance, but concrete with the fibres of the pileus. Tubes at first wart-like, somewhat remote, closed, radiato-fimbriate, at length approximate, elongated, open. Name from the fistulose nature of the hymenium.

*Spec. Char.* FISTULINA HEPATICA. Fleshy, but juicy, rootless, pileus undivided, roundish, dimidiate, spathulate, sometimes substipitate, margin obtuse, rich red-brown tinged with vermilion, studded with minute stellate, furfuraceous tufts, the rudiments of tubes. Substance thick and juicy, marbled like the section of an ox tongue, consisting of fibres which spring from the base, distilling a red pellucid juice which oozes out from different parts of the plant. Hymenium at first covering the whole nodular process; as that becomes spathulate, convex, elegantly tinged with shades of red or vermilion, dotted with rose-like somewhat remote radiated warts, which form a veil to the young tubes; as the pileus expands the tubes elongate, become approximate, straw-coloured or pale olive-yellow, and are jagged at their orifices. Flavour like *A. campestris* but acid.

FISTULINA hepatica, *Withering, Fries, Berkeley, Greville.*

————— buglossoides, *Bulliard.*

BOLETUS hepaticus, *Schæffer, Sowerby, Persoon.*

*Hab.* On various trees, principally oaks. August and September.

There are but two members of the genus *Fistulina* known, one only, our present subject, being European; it is therefore an easily ascertained fungus, about which there can be no error. In its fully matured state it resembles a *Polyporus*, whence Schæffer and others have called it *Boletus* (the old name for all tubed funguses). On making a section of a full-grown plant, it will be found composed of fibres which all take their origin at the base, running up to the pored surface; on tearing the pileus which is easily done in that direction, every bundle of fibres brings with it a certain proportion of tubes, which are concrete with the ends of these fibres, although formed of a distinct substance. This alone will not sufficiently distinguish the *Fistulina* from some of the *Polyporuses*: *P. giganteus*, for instance, which can be ruptured in the same manner; but in this case the tubes are not only concrete with the pileus, but connected among themselves by dissepiments; you cannot separate an isolated tube, whereas in *Fistulina* each tube is distinct in itself, and when dried they curl and twist, looking like spines, particularly if their fringed mouths had not previously opened; their extreme depth is half an inch.

In the neighbourhood of Hayes, where very ancient pollard oaks abound, *Fistulina hepatica* is very common; we have never found it on any other tree, although it is said to grow on others, and in Italy often sprouts out from the chestnut, an eloquent “Tongue,” proclaiming its own excellence, and inviting the passenger to eat it, according to Monsieur Paulet, who is answerable for this comical poetic flight. It is found also on younger oaks, if they have been wounded, and are not in a thriving condition; it grows frequently high up in the tree. Thirty pounds weight, in specimens weighing from a quarter of a pound to two or three pounds each, have several times been collected at one quest.

Having some jars of it which had been boiled down, and had afterwards fermented, the contents were smeared upon and into the recesses of pollard oaks, which had been grubbed the spring previous, and here and there shot out a few leaves in expiring energy; six weeks afterwards, on the fourth of September, a very fine *Fistulina* grew on one of the trunks; this does not prove that it came from the fermented fungus we had placed there; it might have grown of its own accord, without our application, as the tree was exactly in the state to produce it; but be this as it may, the opportunity for watching the growth and development was good, and the results are given, as the history of one is the history of all.

A nodular excrescence of bright vermilion and rich crimson appears, it is quite dull in surface, minutely papillate and velvety all over; in a few days it is spathulate or tongue-shaped, less scarlet in colour, but still all over papillate, except a few shining streaks on the upper surface; the growth continues laterally as well as forwards, so that the spathulate shape is lost, and the “*langue de bœuf*” is broader than it is long; it retains the appearance of a stem from the part next the tree wanting room for expansion. The pileus becomes all over deep dull red and shining at the top, rather viscid, and the epidermis is dotted with the dispersed papillæ; beneath it lies a stratum of red jelly, which runs out if the skin is pierced, (eventually the growth of the plant absorbs this liquid); the hymenium has now become very distinct from the upper surface and is of a lovely buff salmon or flesh colour, studded with dots of a redder hue, the minute “*rosettes*” which as yet veil the tubes; these give a roughness exactly like the texture of a cow’s tongue. In the next stage the tubes appear, lengthen as they grow, and have lost the rosy tinge, being plain straw-buff; as yet their orifices are closed. When these open, they are fringed, and the whole under surface turns dingy olivaceous yellow from the ripened spores; these are hanging beneath in an elegant net-work, not attached “*by spider’s threads*” as at first supposed, but, as far as can be ascertained, attached to each other by an innate viscosity at the moment of ejection from the tubes, thus forming little loops like necklaces; they are pallid ochre with a slight olivaceous tinge. The upper part of the fungus has ultimately become rough and blackened red, channelled in the direction of the fibres, flaccid and discoloured; it resembles at last a piece of bullock’s liver, whence its name *Hepatica*. The process of growth to maturity occupied a fortnight, to decay a third week.

The *Fistulina hepatica* often attains considerable dimensions, but an average fine specimen of the ordinary standard may measure ten inches across, and weigh three or four pounds. The largest being flaccid are not nearly so heavy in proportion as more compact ones. When cut across the likeness to a slice of tongue is ludicrous. In youth the flesh is mottled, pink-white, short, and crisp; in age deep red or purplish, tough, and stringy. It may be taken as a rule that *Fistulinas* are not fit for the table after their tubes are fully developed. In substance we do not recommend them unless finely minced with veal and a little lemon, which amalgamates with the acid of the *Fistulina* itself; this preparation is very eatable: broiled they may appear like a beef-steak to a hungry Croat, but John Bull is better acquainted with the genuine dish. If, however, *Fistulina hepatica* is not beef itself, it is sauce for it, sliced and macerated with salt after the manner of mushroom ketchup; the deep red liquor that is produced should be put hot into a dish, with a little lemon-juice and minced eschalots, and the broiled rump-steak deposited on it; great will be the surprise of the epicure at the quantity of gravy the steak has afforded, greater still when told that it is the simple juice of a fungus, for the similitude to the juice of the beef is exact. This ketchup must be strained from the substance raw, afterwards boiled with spice for keeping like other ketchup, but is not to be employed except to represent beef gravy; it has not the flavour of Mushrooms.

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A. M. H. del.

R. B. & R. imp.

*Agaricus pileolarius*, Sow.







## PLATE LXVI.

AGARICUS PILEOLARIUS, *Sowerby*.

Series LEUCOSPORUS.

Sub-genus CLITOCYBE.<sup>1</sup>Sub-division DASYPHYLLI.<sup>2</sup>

*Spec. Char.* A. PILEOLARIUS. Pileus, in maturity, from four to six inches across, but at first very little wider than the stem; broadly and obtusely umbonate, at length infundibuliform, with or without traces of the umbo, the margin always incurved; compact, firm, elastic, smooth, like kid leather, wrinkling in drying, but swelling out again in a remarkable manner if set in water; clear uniform buff, cream-colour. Gills of the same shade as the pileus or rather redder, (not white, not close), very decurrent, narrow and attenuated towards the stem, the circle where they terminate upon it regularly defined. Stem from four to six inches high, an inch or more thick at the base, attenuated gradually upwards, firm, elastic, streaked with red, solid, (not stuffed) supported among grass &c., by a cottony web which runs up it irregularly. Flesh white (not of the same colour as the pileus), moderately thick in the centre; flavour and smell agreeable. Esculent.

AGARICUS pileolarius, *Sowerby*.————— geotrupus, *Fries*.————— infundibuliformis,  $\beta$ . major, *Berkeley*.*Hab.* Open woodlands, often in rings, like *A. oreades*, upon the roots of grass.

Whatever difficulty there may be about foreign synonymes, we have no hesitation in determining that our present subject is the Agaric to which Sowerby gave the name *Pileolarius*. This, Fries identifies with his *A. geotrupus*, saying that it corresponds with his *A. maximus* but is firmer, smoother, and more changeable in colour. Specimens extremely similar to the *A. pileolarius* now given, have been studied in various sites, particularly in Hampshire, and at Bromley Scrubs, and answer the description of *A. maximus* very well; they grew in hedges, and among dead leaves in woods, and have a strong and disagreeable smell of Prussic Acid; they are every way coarser in their development, irregular in shape, lobed and waved, often eight inches across, with a strongly marked umbo even in the most depressed specimens; the stem is not marked with “long pale blotches of reddish brown” (Sowerby), but the whole plant is uniform in colour, of a redder buff, not so pure and clean as the true *A. pileolarius*.

It is very possible that the differences between these two plants are merely from soil and climate. “Le Grand Allier de Suisse” of Paulet, (*Hypophyllum helveticum*) is very near them. That author says

<sup>1</sup> From κλίτος, a steep or declivity, pointing to the shape of the pileus when young, and κύβη, a head. Veil none. Pileus convex when young, not umbilicate; at length often depressed or infundibuliform. Gills unequal, juiceless, unchangeable, tough, variously fixed or free. Spores white.

<sup>2</sup> From δασύς, close, and φύλλον, a leaf, in allusion to the gills. Pileus dry, smooth, gills close, decurrent, or acutely adnate.

he could find no description of it, although very remarkable: "it is of a uniform buff hue, the colour of the belly of the chamois or fawn; four or five inches high, the pileus 'mameloné' in the centre, four or five inches wide, dry, even, smooth as satin. The flesh white, rather soft in the centre, stem cylindrical, stuffed, of half an inch diameter, three or four inches high, the base tuberous or bulbous, with little downy roots. When fresh it smells strongly of garlic, but after a time this odour is dissipated, and it finally changes to that of bitter almonds. It is found in Switzerland and in Franche Comté, and sold with the Mousseron de Suisse (*Prunulus* or *A. georgii*); it is perfectly wholesome." (Paulet.)

"In hedges &c.; sometimes the lip is not turned over, but wine-glass-shaped. Smell like almonds, clean, hard, smooth, even-coloured like buff-kid; gills the same colour." (F.R. Hants specimens). Given a picturesque giant oak, which might remember Cæsar, only probably he never came to Keston, and fancy a circle round it of these fairy Tazzas; all perfect in form, and growing distinctly at about two feet apart in a ring of thirty feet in diameter; with fine deer-grass and green mosses at their feet, and the feathers of the fern waving over all; the situation is the verge of a lofty inland promontory, where the air is as bracing and pure as that of the Swiss mountains themselves, and perhaps as you breathe it, and look on all the beauty round you, you will consider the pure quality of the Agarics accounted for, compared with such sites as the fat meadows of the Itchin or the foul woods, aptly styled 'Scrubs.' When free from insect life, this fungus dries remarkably well, corrugating from the margin inwards in regular concentric wrinkles; if placed erect in a glass of water, as much as ten days after gathering, it swells gradually as the liquid is imbibed by the stem, till restored to its original dimensions; but this experiment cannot be repeated.

All the examples we have studied had elastically *solid stems* diffused into the pileus, but perhaps the central texture is loose in large specimens growing with great rapidity, and if so, it will remove a discrepancy between *A. pileolarius* as we observed it, and as Fries describes it, under the head *A. geotrupus*, and his *A. maximus*. In consistency and flavour as a culinary article, it is nearest *A. oreades*.

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A. M. H. del.

*Agaricus deliciosus*, *Lin.*

Reeve Delin. & Reeve Imp.







## PLATE LXVII.

AGARICUS DELICIOSUS, *Linnæus*.*Orange milked Agaric.*

Series LEUCOSPORUS.

Sub-genus GALORRHEUS.<sup>1</sup>

*Spec. Char.* A. DELICIOSUS. Pileus four inches or more broad, viscid, zoned, orange-fulvous turning pale, dull, as if there were the remains of a minute very closely pressed dirty-white web. Hemispherical when young, in which state the margin is decidedly involute and tomentose, at length expanded, fleshy. The whole plant abounding with orange milk, which on exposure to the air, dries green. Gills decurrent, from the first of the same colour as the pileus, forked at the base, rather broad and distant; spores ochraceous white. Stem three inches high, curved, stuffed, more or less hollow, scrobiculate, strigose at the base. Odour and taste agreeable, but sometimes slightly acrid.

AGARICUS deliciosus, *Linnæus*, *Schæffer*, *Fries*, *Berkeley*, *Sowerby*, *Withering*.

*Hab.* Under the Scotch fir (*Pinus sylvestris*), not uncommon. September and October. Esculent. Excellent.

The Agaric most likely to be mistaken for *A. deliciosus*, is one we have given before, *A. flexuosus*; small specimens of that, while growing, are much like faded ones of the *Deliciosus*, having the same appearance of a pallid web being extended over the pileus, or rather as if excoiated; both are viscid and zoned. On viewing the under side, however, of these two Agarics, there is considerable difference in the hue of the gills, those of *A. deliciosus* being a much deeper colour; reddish-yellow, "bright aurora or flame-coloured," shot with the pale spores, which are not pure dead white, but have a decided tinge of yellow-ochre, when in a mass.

The fracture of *A. deliciosus*, or any milky Agaric supposed to be it, is the main point to attend to; the juices are invariably in the true plant, rich orange, like a slice of carrot; *A. theiogalus* has white milk changing to a beautiful delicate yellow, but this cannot be confounded with our present subject; not only is "delicate yellow" by no means the same thing as intense orange, but the cut or broken parts of *A. theiogalus* are white at first, and assume the yellow tinge afterwards. The milk of many of this genus of Agarics undergoes a change from exposure to the air, but none the peculiar one which at once determines *A. deliciosus*; the orange exudation becomes green, and this fact, which if we knew no better, might be supposed an objection to it, is a token that we have got hold of one of the best of the esculent funguses! We fancy, for we do not know, that a Boletus, which turns blue or green when divided, is therefore deleterious, but this is possibly a fallacy, for in Agarics certainly that colour is not connected in some cases,

<sup>1</sup> From γάλα, *milk*, and ῥέω, to *flow*. Veil none. Stem naked, firm, subequal, diffused into the pileus. Pileus fleshy, firm, plano-depressed, umbilicate, margin even, when young involute. Gills unequal, often forked, narrow, attenuated behind, adnato-decurrent. The whole plant abounding with a milky juice. Spores white, sometimes ochraceous.

with injurious qualities. *A. lepidus*, an excellent member of the Russulæ, when subjected to culinary operations, turns to an intense verdigris wherever it has been cut ; but instead of rejecting the contents of the "Tourtière" (anglicè, pie-dish) on that account we should eat with more confidence, assured by that peculiar change to green, that *A. emeticus* had not been used instead of the wholesome kind. The "Tourtière" mode of cooking suits *A. deliciosus* best, as it is firm and crisp in substance ; be careful to use only sound specimens, reduce these by cutting across to one uniform bulk, place the pieces in a pie-dish with a little pepper and salt, and a small bit of butter on each side, tie a paper over the dish and bake gently from half to three quarters of an hour. Serve them up in the same hot dish, and you will have something much better than kidneys, which they strongly resemble, both in flavour and consistence. There is but one Agaric better than this, its near relative *A. volenum* which is much more rare, but its portrait has been taken, and if it can be included in our stipulated number of plates, it shall appear. We have never found *A. deliciosus* in any other situation than where the earth was filled with roots of the Scotch fir ; in plantations among young trees it does not grow, a certain period seems required before any spot planted with this pine, is favourable to the Agaric ; while the branches are yet near the soil, and before the roots have stretched far from the trunk it does not appear, but afterwards, when the space beneath the tree lies fair and open, in exposed situations such as parks and commons, the search for *A. deliciosus* is seldom in vain. It is not confined to northern or elevated sites, for a most abundant growth was in Avington Park, Hants ; there is one peculiarity, which seems universal, it prefers the south and south-west side of the fir-tree, it is never on the north-east and generally placed beyond the drip from the branches. Aged specimens of *A. deliciosus* are said to possess some acrimony in a raw state ; this has never been the case with Kentish ones ; Mr. Francis found them "*sometimes more or less acrid* ;" Mr. Berkeley's experience is of their being always so. All that can be said is, we have so often eaten them as to be convinced of their perfect wholesomeness ; this is also the opinion of our friend Dr. Badham ; but if, in any peculiar locality, they are found to be seriously acrimonious, they should be ventured on more cautiously ; they will probably lose that flavour in cooking.

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F.R. del.

R.B. & R. imp.

*Agaricus caulicinalis*, Bulliard.







## PLATE LXVIII.

AGARICUS CAULICINALIS, *Bulliard*.*Small scaly Agaric.*

Series LEUCOSPORUS.

Subgenus COLLYBIA.<sup>1</sup>

*Spec. Char.* A. CAULICINALIS. Pileus from two to seven lines broad, convex at first, and minutely umbonate, then expanded, depressed or umbilicate, whitish, with small shining red-brown scales, disposed sometimes in zones, rendering the margin jagged; sometimes the pileus is merely minutely velvety; in large specimens the margin is sulcate. Gills distant, with a few shorter ones, nearly free, thickish, of a yellowish tinge, various in breadth, sometimes rather ventricose. Stem from three quarters of an inch to an inch and a half high, not half a line thick, flexuous, filiform, clothed with red-brown woolly tomentum, or squamules, fibrillose or scaly; often perforating the substance on which it grows, composed of fibres, with a narrow fistulose line down the centre.

AGARICUS caulicinalis, *Bulliard*, *Berkeley*.

—— stipitarius, *Fries*.

*Hab.* On grass, thatch, sticks, stumps, &c. August and September.

“When in perfection few Agarics are more elegant;” with this opinion of Mr. Berkeley’s every one will coincide. Among the notes upon it we find—“scent like the mushroom, taste also like the mushroom;” but alas! for the epicure who may fancy that, like a lark or wheat-ear, esculent excellence is concentrated in small bodies; the next observation is—“flesh none:” it would scarcely furnish sauce for a lark, even if found in abundance, which it is not. The specimens from which the annexed drawing was made, grew “in thick clusters upon mossy thatch, firmly attached to the straws, shrivelling into little cups, green with minute Algæ in age.”

We are as anxious as any one can be to shew the value and good qualities of the tribe generally, and so when we can say nothing else in praise, are glad to point out beauty at least; and to declare against the necessity of proving utility as the only just ground for attention. Let the ugly things be useful; we will some day introduce to you, good utilitarian, the Boletus, called *par excellence* Edulis.

The world is full of beauty that we pass by unheeded. There, opposite, is an ugly thatched barn, elsewhere perhaps picturesque, but not when blocking the view from the window; we cannot plant it out, there is a road between—we cannot cover it with ivy, for it is not ours; but look with changed ideas, set aside the prejudiced spectacles, and you will see that every season decks that ragged thatch with beauties of its own;

<sup>1</sup> From κολλυβος, a *small piece of money*. Stem fistulose, though often indistinctly so, slender, equal, round, firm, often rooting. Pileus carnosio-membranaceous, tough, convex, then plane, sometimes depressed in the centre, smooth, dry. Gills obtuse behind, free or fixed, never decurrent, unequal, juiceless, plane, quite entire. Small dry persistent fungi, growing on the ground, or epiphytes.

the greenest mosses—now red-brown in the sun-shine, now decked with thousands of fanciful fairy bells or extinguisher caps, and on those large long straws, which the sparrows loosened in their rummage for grains of corn left behind, grow the small delicate tufts of *Agaricus caulicinalis*, clasping the straws by their woolly stems ; as fantastic and graceful as if Titania herself had created them to ornament her bower.

And so through life, good reader, may it be with thee ; if the barn must be there, make the most of the thatch.

“But opposite me is an old wall : I should not mind if I had your thatch with the pretty things on it.” And if I had your bricks, I should study the wonderful “weather stains,” as the artist *calls them*, Leprarias, &c., *they are*.

There are higher considerations than mere optimism to teach dutiful resignation, but that will stand in good stead to strengthen patience and content.

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F. R. del

R. B. & R. imp

*Agaricus peronatus*, Bolton.







## PLATE LXIX.

AGARICUS PERONATUS, *Bolton*.*Spatterdash Agaric.*

Series LEUCOSPORUS.

Sub-genus CLITOCYBE.

Sub-division SCORTEI.<sup>1</sup>

*Spec. Char.* AGARICUS PERONATUS. Pileus from one inch to two inches and a half broad, convex or campanulate, at length expanded, sometimes umbonate, carnosio-coriaceous, subrufescent or yellowish, pallid when dry, clothed with a minute matted silkiness. Gills pale reddish or buffish, of the same shade as the pileus, with a yellowish margin, distinct, rounded behind, almost free. Stem firm two to three inches high, two lines thick, composed of fibres, solid above and downy, hollow below and there covered with dense yellow strigæ. Taste nauseous, acrid; smell fungoid, disagreeable.

AGARICUS peronatus, *Bolton, Fries, Berkeley, Sow., With., Greville.*

*Hab.* Among rotten leaves, particularly of the oak; July to November, not uncommon.

In the plate given of the various Agarics which have been confounded with the Champignon, *A. oreades*, it appeared quite unnecessary to include *A. peronatus*, although one of the nearest allies of that excellent species, for it is so very easily distinguished as to preclude the possibility of mistake. Many Agarics are held in an upright position among fallen leaves, &c. by cottony fibres, which proceeding from the stem throw out their grasping tentacles in every direction, but chiefly in that, where resistance is most needed; but the strigæ, which clothe the lower half of the stem in the present instance, are much more even, close, and of equal developement all round, like a "fluffy" long-napped woollen hose, drawn round the lower extremity of the toad-stool, which thus stands boldly, and, we suppose, comfortably supported on fallen leaves of oak, an elegant and strongly marked individual of the genus Agaric; no other has half so determined a legging. The buff variety of *Laccatus* may carelessly be mistaken for it, for that has cottony fibres at the base, but of a snow white hue, and not half so abundant and regular as the "Guernsey hose" of *A. peronatus*, which are never white but cream-yellow; the peculiar red tint, also indicative of an *A. laccatus*, is absent in *A. peronatus*, which is of a uniform buff-leather colour, such as spatterdashes were made of in the ancient days, when "Antigropelos" had not dawned upon the rapt vision of their patentee. "Perhaps this Agaric was named from the texture of its pileus, instead of the covering for its leg?" this doubt is suggested by a mischievous etymologist; any peg will do to hang etymological arguments upon, and we ever eschew

<sup>1</sup> From *scorteus*, coriaceous. Pileus sub-coriaceous, dry. Gills free, subdistant, at length pallid.

dispute. In the absence of Bolton, who alone could say why he thus designated the Agaric,<sup>1</sup> we leave it to the reader to decide on the probabilities, simply hinting, that the usual position of a spatterdash is not on the head, and thus unavoidably demonstrating our own personal leaning in the matter. To quit our stilts, the substance of *Peronatus* is tough and leathery, which gives it place among the Scortei, or coriaceous, white spored Agarics, belonging to the division *Clitocybe*, the members of which, being entirely destitute of veil, have of course none of those appendages which are the remains of it in other classes, such as the ring, scaly epidermis, or fibrillose stem; for the strigæ on the stem of *Peronatus* have no connection with such an origin. The smell is not agreeable, the flavour is pungent and nauseous: it is a very pretty member of the great Agaric family, more we cannot advance in its favour; we are ignorant of any injurious property for which it may deserve condemnation, but being of suspicious character, any esculent experiment upon it is to be deprecated.

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<sup>1</sup> "*Peronatus*" is a term applied to all those stems which have similar strigæ at the base, and this Agaric among *Peronated* ones is, *par excellence*, *Peronatus*.







A.M.H. del.

Reeve, Benham & Reeve, imp.

*Lycopodon pyriforme*, Schaffner.







## PLATE LXX.

LYCOPERDON PYRIFORME, *Schæffer*.*Pear shaped Puff-ball.*

*Gen. Char.* Peridium membranaceous, with an adnate subpersistent bark, within furnished at the base with a spongy sterile stratum. Capillitium unequal.

*Spec. Char.* LYCOPERDON PYRIFORME. Peridium membranaceous, persistent, subpyriform, opening by the umbonate apex, covered with the innate bark, and very slender fugacious scales, columella conic, spores greenish-yellow.

LYCOPERDON pyriforme, *Schæffer*, *Fries*, *Berkeley*, *Bulliard*, *Greville*.

———— Proteus, *Withering*.

———— ovoideum, *Bulliard*.

*Hab.* On rotten stumps in sandy plains and on peaty commons often tufted.

Among the many Protean forms of *Lycoperdon gemmatum* will be found examples extremely resembling this *Lycoperdon pyriforme*; the differences are almost inappreciable, one only is, on comparison of matured specimens, constant, it is this: in all the varieties of *L. gemmatum* the contents of the peridium, receptacle, or puff-ball are of a much deeper shade than in *L. pyriforme* which has them, greenish pale yellow instead of the yellowish olive-green of its rival. An elongated barren stratum, forming a stem to the receptacle, is in common to both species, so is the conic central column, running from the stem towards the apex of the puff, giving it an umbonate shape; the external mealy scales are no distinction, but the umbo is more invariably and decidedly prominent, and of a deeper brown in *L. pyriforme*; this latter fungus is also of much less substantial consistence than the commoner puff-balls, which when pressed are elastic, leathery, and firm before they burst naturally, while *L. pyriforme* yields to the finger as a delicate inflated membrane, so delicate and fragile that the slightest pressure indents the head, which decays and bursts at its most rotund portion, before the mouth opens. Truth to tell, in the range of our personal experience we never saw it open-mouthed at all, but dare not suppose that error exists on the part of higher authorities. We have only found it on light peaty sand after heavy rains; in a drier habitat the plant probably has time to expand “selon les règles,” instead of irregularly bursting from excess of moisture.

Whether *Lycoperdon pyriforme* ever affects the “ring” style of growth we cannot say, our specimens

<sup>1</sup> From γαστήρ, the *stomach*, and μύκης, a *fungus*; hymenium included within the receptacle.

<sup>2</sup> From θρίξ, a *hair*, and γαστήρ, the *stomach*; receptacles filled with floccose hairs among which the spores are placed.

are not tufted, although grouped in close neighbourhood, two together, or at most three, springing from one spot without the stems thence becoming confluent; they push each other aside and are essentially separate plants. Upon stumps we have never met with it; in that situation the crowding of the stems into a small and rigid space would occasion an analogous mode of growth, the spawn being circumscribed and unable to spread. All funguses increasing by spawn form rings when they are uninterrupted, probably in part from the central exhaustion causing the young shoots seeking food to push into new soil. These rings annually increase, and, in the case of most of the *Lycoperdon* family, become very large.

The Giant Puff-ball is of annular growth, so is the common Puff-ball or Devil's Snuff-box, and this year (1848) we found on the same site of sandy peat which produces *Lycoperdon pyriforme*, an immense ring of *L. saccatum*, the individual members of which were about a foot apart. It is not meant to imply that funguses increasing by spawn are invariably found in rings, because it is self-evident every ring must have had a solitary plant or small group as a nucleus, and after its increase has attained a circular development, so many accidents may divert the tender filaments from their natural course; we believe however that if free from injury or obstacle, to form circles increasing outwardly is the natural tendency of spawn-propagated funguses. Vittadini says, if small puff-balls be dug up they will be found connected by fragile threads from which proceed minute embryo puffs; that these delicate communications, which resemble the finest cotton fibres should be destroyed, thereby impairing the form of the ring, is not wonderful: it is much more wonderful that any escape in pastures and exposed situations. Every worm that pushes up, every insect that buries itself, must destroy threads finer than the finest roots of phenogamous plants. Mr. Mole mines underneath; Mrs. Sow and her progeny root above, and the hoof of horse or ox crushes: only on lawns can we watch the progressive increase of "Fairy-rings" through several seasons, but alas! so disgusting are they to practical gardeners, that to eradicate the offenders is subject for a Society-of-Arts prize! We assure the Society no palliatives will answer, radical measures alone succeed: dig out the soil two feet deep and a foot outwardly beyond the circle of green, then fresh soil and turf must be substituted, guiltless of Champignons.

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A. M. H. del

R. B. & R. imp

*Agaricus aureus*, Bull.







## PLATE LXXI.

AGARICUS AUREUS, *Bulliard*.*Golden Agaric.*Series DERMINUS.<sup>1</sup>Sub-genus PHOLIOTA.<sup>2</sup>

*Spec. Char.* A. AUREUS. Gregarious, tufted. Pileus very variable in size, sometimes four inches or more broad, convexo-expanded, rich tawny with broad, adpressed, silky scales in the centre, which towards the margin become mere streaks; fleshy. Flesh pale yellow. Gills at first pale yellow, then tawny ferruginous from the spores, adnexed, rounded behind or decurrent in the same group. Spores tawny ferruginous. Stem three or four inches high, one inch or more thick, solid, tough, spongy above, below looser, often cavernous; thickened downwards, bulbous, furnished near the top with a small deflexed, rather thick ring which is densely powdered with the spores; in aged specimens it sometimes has disappeared, but the place remains marked on the stem; under the gills minutely squamulose, below fibrillose, the fibrillæ close, paler than the pileus. Root consisting of a few downy fibres. Taste bitter. Sometimes the pileus is dull and the scales not adpressed, sometimes shining, with adpressed scales. In each tuft one or two Agarics only attain full dimensions and expansion, at the expense of all the rest, which are crowded, compressed, and even flattened.

AGARICUS aureus, *Bulliard, Fries, Berkeley, Sowerby.*

*Hab.* On stumps or roots, left in the ground, of various trees. August to October.

*Agaricus aureus* is a very characteristic fungus, where it has room to develop itself properly, particularly before the ring breaks away from the pileus; the round head and thick bulbous stem out of all proportion with it, will strike every one as singular. The veil of most Agarics, if they are taken up in a half-grown state, separates from the pileus, forming the ring, as if they had remained undisturbed; the various species of Amanite do this remarkably; however close the curtain may be over-night, it is generally drawn aside in the morning; but *A. aureus* removed from its site is unchangeable, no expansion takes place, for days it continues in the same state, probably because it is of a much firmer, less juicy consistency than these others. The growth is very slow, and out of groups consisting of a dozen in family, one or two only usurp, and keep the upper hand entirely, as the plate represents. The eldest son flourishes in all the grandeur of primogeniture, the second is tolerably comfortable as heir presumptive, the rest—stop! we had better not talk politics—at any rate, one thing is very peculiar in the families of *A. aureus*, if the larger specimens decay or are taken away, the smaller do not fill out in their place; they appear to have been so

<sup>1</sup> From δέρμα, *skin* or *membrane*. Veil not arachnoid. Spores ferruginous.

<sup>2</sup> From φολίς, a *scale*. Veil dry forming a ring which is sometimes membranaceous, sometimes radiato-floccose. Stem more or less scaly. Pileus convex, at length more or less plane, not umbilicate. Gills unequal, juiceless, changing colour. Spores ferruginous or fulvo-ferruginous, not reddish-ochre.

dwarfed by the other vigorous growths as never to recover it, and weeks after may be found no further advanced; so far, our impertinent comparison fails, for the poor little middy who went to sea, because he was a family superfluity yesterday, is recalled to be a great man now his brothers are removed, and he accepts the first position in as noble a style as they held it.

This Agaric, like many other yellow Funguses, is bitter; a number of Phenogamous plants in which the yellow principle predominates are so, hence, in the days of simples, it was believed that yellow things cured that yellow melancholy, the Jaundice; if homœopathic sympathy and faith were not effectual, the tonic might do good. In all probability various funguses have medicinal qualities of which we are totally ignorant. The testing them on the canine race, as Paulet did, is not satisfactory to humanity, and none feel disposed to make essays upon themselves which would, perhaps, render them liable to be tried for manslaughter, if others were the subjects.

With regard to ascertaining any particular species under the head Derminus, be careful in the first place that it is in that series at all; make sure of the spores which must be rusty yellow, not reddish-ochre, in the *Cortinarius* Agarics. It is well to keep a sample of spores of an acknowledged member of each class to compare others with. After proving your Agaric to be included in Derminus, the search is greatly contracted, few have a substantial persistent ring; of them, some are viscid when moist or in youth; but *A. aureus* is always quite dry. *Squarrosus* and *caperatus* cannot be taken for it; *aurivellus* seems the only one liable to confusion with it, and that is veiled at the apex. This (*A. aureus*) has the veil attached some distance down the stem: one difference, such as this, sufficeth.

We found *A. aureus* at the foot of an oak; also at a distance from any growing tree, but on examination, the roots of one remained in the ground.

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F.R. del.

*Agaricus psammocephalus*, Bull.

Reeve Benham & Reeve imp.







## PLATE LXXII.

AGARICUS PSAMMOCEPHALUS, *Bulliard*.Series CORTINARIA.<sup>1</sup>Sub-genus TELAMONIA.<sup>2</sup>

*Spec. Char.* Pileus from two to four inches broad, fleshy, the margin thin; tawny-cinnamon; at first convex, then expanded, at length umbonate, often in age splitting at the margin; furfuraceous squamulose, from the remains of the veil, as if powdered with grit-sand, whence the name. Flesh of a paler shade of the same colour as the pileus, not white (as in Bulliard's plate). Gills, in full maturity, darker than the pileus; arcuato-adnate, sometimes with a decurrent tooth, close, compressed. Stem from four to six inches high, half an inch thick, attenuated, stuffed, squamulose and peronate from the remains of the veil, which forms an evanescent ring, above which the stem is naked and smooth. Inodorous.

AGARICUS psammocephalus, *Bulliard, Fries, Berkeley*, (MSS.)

*Hab.* On Hayes Common, among furze-bushes. Autumn.

When *Agaricus psammocephalus* was found on Hayes Common some years ago, it was new to English Botany; Bulliard had figured it, but not altogether correctly; Fries says "it is common in pine woods," we suppose he means in those of his own particular region. In the same situation that we first discovered it, we have only once succeeded in procuring other specimens; perhaps in the ancient fir forests of Scotland, it may be plentiful; it certainly is not so in southern Britain. Climate, however, is very independent of degrees of latitude. The table-land forming Baston Common and Keston Heath, terminating with Holwood, is said to be quite as bracing and cold as Westmoreland. Great purity of air is needful to many plants, and this district supplies a list which includes an immense variety, for if alpine specimens can be gathered on the brow, those of southern England flourish in the secluded valley beneath. On Keston Heath grows in profusion the Lancashire bog *Asphodel*, *Narthecium ossifragum*, in company with the snowy cotton rush; *Hypericum elodes* fringes the little runlet, the percolation from which forms the swamp; a *Cnicus*, nearly unique, lifts up its solitary purple head; the richest mosses, pale chrysolite green, or reddish straw-colour, cover a great portion of the bog, tempting the foot to tread on them as a safe spot, then giving all the water they contain like sponges, into the shoe; and here and there is a black space of peat, sparkling with silver grit-sand and gemmed with the scarlet sun-dew and its delicate pearl blossoms. It is a charming bog! long may it remain so, but we feel a reluctance to mention the spot, lest some day we should find London "Herbalists" ransacking it. They have exterminated the bee-orchis from the fields which were once lilac with it, the rarer kinds we seldom find now in their old haunts. *Osmunda regalis*

<sup>1</sup> From *Cortina*, a veil. Spores reddish ochre. Veil arachnoid.

<sup>2</sup> From *τελαμών*, *lint*. Veil consisting of arachnoid fibres woven into a subpersistent ring. Stem solid, at length softer within, firm, fibrillose. Pileus more or less fleshy, the margin thin, campanulate or convex, then expanded, dry, squamulose or fibrillose. Gills adnate or emarginate, broad, distant, changing colour. Large firm Agarics, growing on the ground.

was all carried off when ferns became "the fashion," and Covent Garden rejoices in the glorious fox-gloves which used to shoot up in such profusion in our dells. Our lichens and mosses trim the bottoms of all the stuffed-animals' glass cases, a few acres of herb Paris remain, but no one seems to fancy that dowdy plant! The Mycologist, however, has as yet no need to complain; whether we explore the Warmount, where *Agaricus Georgii* grows in its vast rings above old Roman sepulchres, and where in the hottest summer-day the air blows chilly round the Black-Ness, as it is justly called, for at a distance its promontorial nose generally looms dark and dull; or whether we roam through the warm, reeking, moist atmosphere of the lovely dell called Pole Cat Alley, where tall birches weep over our heads, their silver stems rising gracefully among the gnarled pollard-oaks; where feathery fern grows six feet high beside the mossy green, always dewy path, which the mole and the mole-cricket take the liberty of ploughing up, and we bury our foot in the loosened earth, as we are looking after that night-jar which just flew from among the branches; where the rabbit's white scut pops out of sight, and the adder and grey snake are said to haunt, but we never met them; where nightingales may be heard all day, and you cannot hear yourself for nightingales in the warm luscious dewy evenings; there, whether among dead leaves which lie for years preventing all herbage from growing, or upon the turf, grassy parasites—the Mycologist finds *his* treasures undisturbed; happy people we! for our common is not worth enclosing! and if speculation longed to try experiments, all the parish would rise as one to oppose it. So Agarics, Boletuses, *et hoc genus omne* are likely still to flourish.

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